ENGINEERING
LIBRARY

June 6, 1949

JUN 6 1949

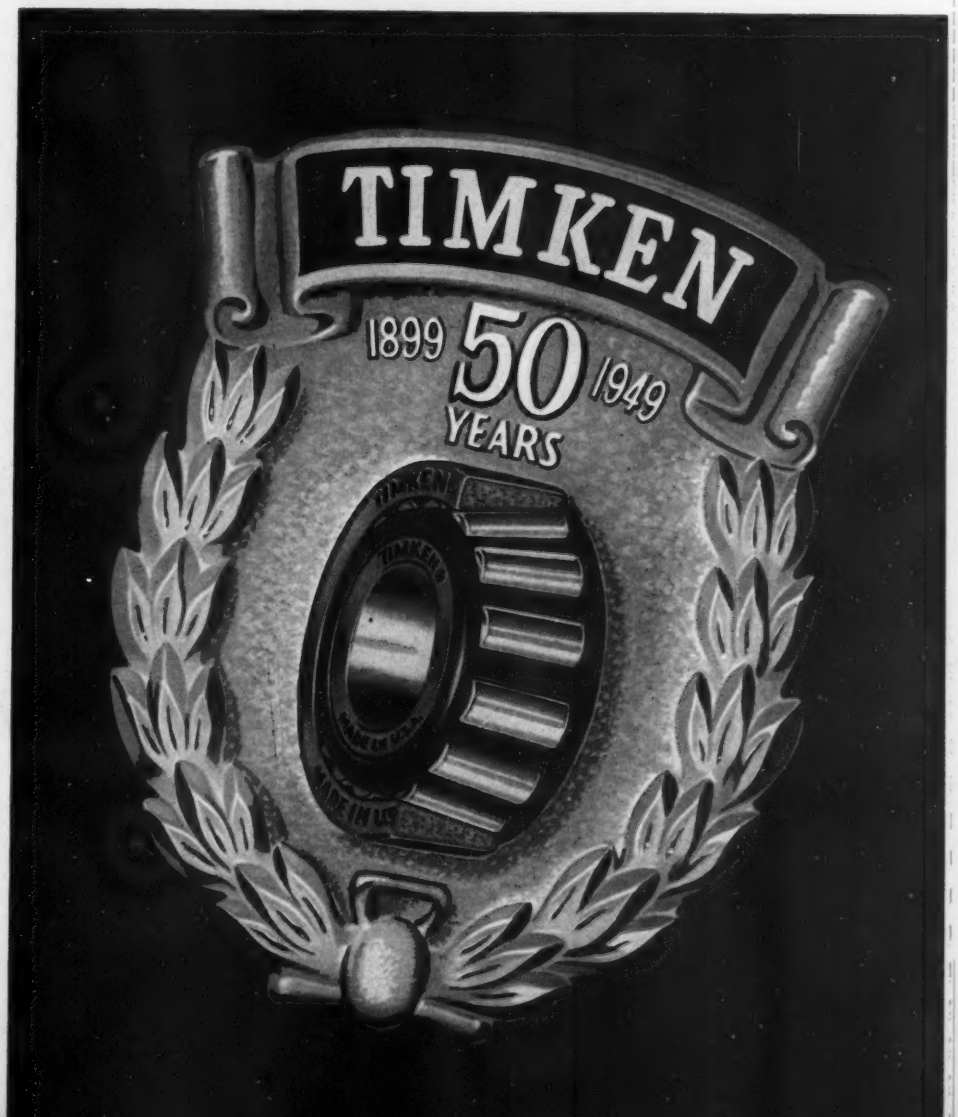
STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS — PAGE 61

50th birthday of the company whose products you know by the trade-mark: TIMKEN

Since 1899 The Timken Roller Bearing Company has been helping American industry get the most for its money.



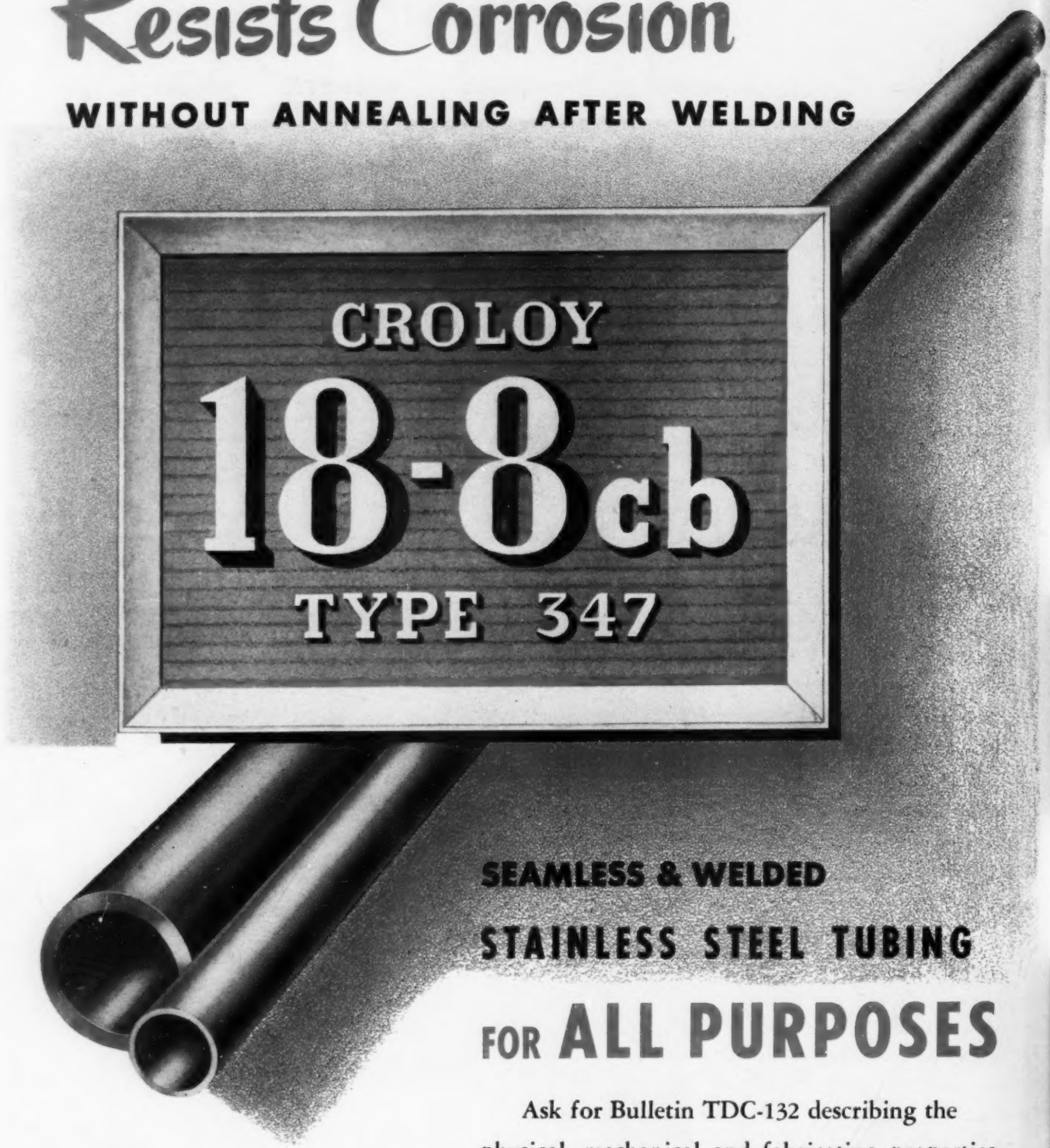
Nobody likes to buy a "pig in a poke". In America you don't have to. You're protected by trade-marks like "TIMKEN".

Registered as a trade-mark in the United States Patent Office, "TIMKEN" identifies products made by the Timken Roller Bearing Company - - - Timken tapered roller bearings, Timken alloy steels and seamless tubing, and Timken removable rock bits.

Experience over the years has shown Timken products to be the finest in their respective fields. And many thousands of men and women are working hard to keep them that way. No wonder it has become a habit throughout industry to look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

Resists Corrosion

WITHOUT ANNEALING AFTER WELDING



SEAMLESS & WELDED

STAINLESS STEEL TUBING

FOR ALL PURPOSES

Ask for Bulletin TDC-132 describing the physical, mechanical and fabricating properties.

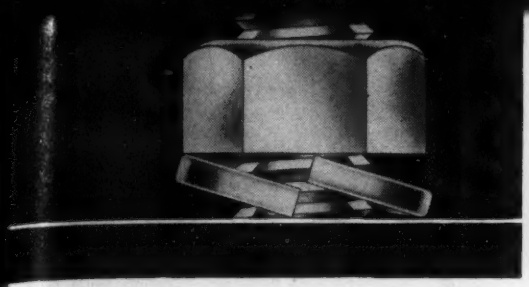
TA-1466-S

THE BABCOCK & WILCOX TUBE COMPANY
General Offices: Beaver Falls, Pa.
Plants: Beaver Falls, Pa., and Alliance, Ohio

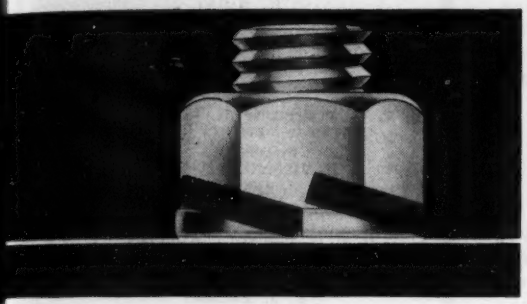
BABCOCK & WILCOX SEAMLESS & WELDED TUBES

A full range of Stainless, Alloy and Carbon Steel Tubing for all Pressure and Mechanical Applications

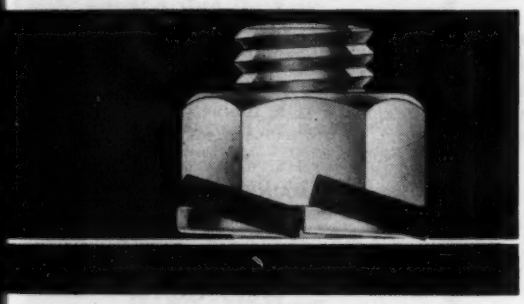
UNIVERSITY OF MICHIGAN LIBRARIES



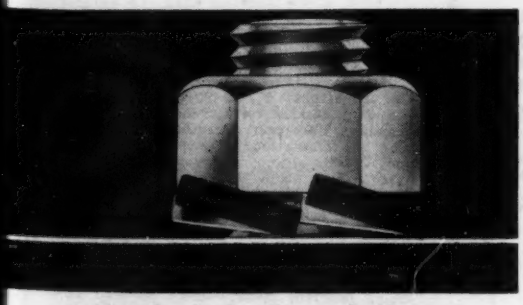
Nut makes contact with spring lock washer. Compression begins.



Nut wrenched tight. Spring lock washer fully-compressed from original form shown in red.



Normal wear. Note reactive force left in washer as indicated in red.



Nut backed off one-half turn. Assembly is still under tension as shown in red, while an assembly without a spring lock washer would be loose.

for dependable enduring BOLT TIGHTNESS you can't beat RELIANCE SPRING LOCK WASHERS

When you use a spring lock washer on a bolted assembly, you provide the best insurance it is possible to obtain against looseness due to wear, stress and vibration.

The spring lock washer's effectiveness results from the powerful reactive force stored up in the husky helical coil spring when it is compressed to flatness by wrenching the nut tight. This reactive force exerts constant pressure under the head of the bolt or nut as long as any compression is left, keeping components under tension despite wear, vibration and stresses long after weaker fastening devices cease to function.

When you use a Reliance Spring Lock Washer, you are insured maximum dependability and endurance because Reliance Spring Lock Washers are fabricated from special lock-washer steel, cold drawn in Reliance's own mill to develop utmost non-fatiguing reactive force.

For dependable, enduring holding power, you can't beat Reliance Spring Lock Washers. There's a type developed especially for highest holding efficiency on any bolted assembly. Write for Lock Washer Folder 6A.

EATON SPRINGTITE — all-in-one unit — a Reliance Spring Lock Washer pre-assembled on bolt or screw — speeds assembly, cuts costs. Write for folder.

RELIANCE RINGS produce strong shoulders — on outer races of bearings, on shafts or in counter bores — quickly at less cost. Write for folder.

Reliance Division

EATON

EATON MANUFACTURING COMPANY

OFFICES AND PLANT **MASSILLON, OHIO**

Sales Offices: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

Sheets & Strip

This week sees the first of a series of expert articles by an expert. Charley McGranahan is no stranger to anyone who has had much to do with flat rolled steel products. From his "pulpit" on Pittsburgh's Second Avenue he can see sheet and strip mills operating all over the country, figuratively speaking, and his treatise on the operation of such mills carries all the industry's stamp of approval. This series will be one of the most interesting of all the sections of our current steelmaking project, and we know you won't want to miss an issue.

Fifty Years Ago Dept.

Fifty years ago the iron market was in an uproar, with pig being quoted close to $17 at Pittsburgh. The editors expressed horror at the situation, because buyers were apparently showing no resistance to such unheard of high prices. Furthermore, iron was being bought as far as six months ahead at those prices! Under personals in that issue we note that Henry Phipps and H. C. Frick are sailing for Europe to see Mr. Carnegie; Senator Mark Hanna and Samuel Mather are also sailing for Europe; and on the back cover the Marion Steam Shovel Co. is advertising a giant shovel for iron mining. It is so large, in fact, that they had to put the cut of it in the ad sideways for lack of space!

The Red Book Is Here

Now off the press is one of the more important but less frequently issued of the Penton publications. The Great Lakes Red Book has been for years the bible of lakefaring (!) men. If men still wore vests, we could describe it as a vest-pocket directory of over 1500 vessels plying the Great Lakes. Since vests are now a thing of the past, according to most men's tailors, all we can say is that the Red Book puts in the palm of your hand a list of the owners, captains, and engineers of these ships, lists all shipbuilding and repair yards, and other data of importance to the marine trade. It's about our only tie with the blue waters we can see out our office window, but we like to look it over every year when it comes out and wish we were aboard some of the craft it lists. We can report that there are still a number of barges named Hilda on the lakes, that Alice Vivian is a dredge (poor girl), and that sex is a strange thing among water craft. There seems to be a fair percentage of males, females, and neuter gender among them, plus the fact that the Alexander B. is now the Connie M., which may or may not mean a complete changeover.

Our Natal Day

If you are anniversary minded, you can join us in harmony this week while we render, and we mean *render*, "Happy Birthday to Us". That's because we are going to be fourteen years old next Friday. June 10, 1935 was a Monday, and on that day this column first saw the light. A little quick calculation, combined with the probably rather faulty memory that one year we missed a yearbook issue, and one year had 53 Mondays in it, tells us that this is the 728th time that you folks have been subjected to the peregrinations of these paragraphs. Some day we are going to find out by looking back over all 728 issues just how well we have adhered to the original idea of the column, as stated in that first appearance.

Puzzle Corner

If you have been stringing beads for the last two weeks, trying to catch up with the little girl in our puzzle, you can stop now. She can make only 136 different *patterns*, which is what we asked for. Somebody around here tried to figure it out on the basis of different beads, which apparently comes out about equal to the number of stars on a summer night, or something. Here's a sum, which is added up correctly except that the numbers have been replaced by letters. If you can find the right substitutes, you, too, can check the addition:

ADAM
AND
EVE
ON
A
———
RAFT

Shrdlu

(Editorial Index—page 61)

STEEL

Vol. 124—No. 23 June 6, 1949

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

ADVERTISING

R. C. JAENKE
Advertising Manager

C. H. BAILEY
Service Manager

A. V. ANDERSON
Production Manager

New York:
E. W. KREUTZBERG, K. A. ZOLLNER
CALVIN FISHER, JR.

Pittsburgh:
S. H. JASPER, B. C. SNELL

Chicago:
L. C. PELOTT, V. G. BRETTMAN

Cleveland:
D. C. KIEFER, H. G. ROWLAND
W. L. POLAND

Los Angeles:
F. J. FULLER

•

CIRCULATION AND MARKET RESEARCH

J. W. ZUBER
Director

R. L. HARTFORD
Research Manager

H. E. METZNER
Circulation

G. R. EBERSOLE
Mail & List Service

Field Representatives:
C. A. PRICE, H. R. DUNNE, D. G. HEWITT
B. W. SCHEINERT

•

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICE

New York 17 ..... 16 East 43rd St.
Murray Hill 2-2581

Chicago 11 ..... 520 North Michigan Ave
Whitehall 4-1234

Pittsburgh 19 ..... 2806 Koppers Bldg.
Atlantic 3211

Los Angeles 4 130 N. New Hampshire Ave.
Fairfax 1758

London: 2 Caxton St., Westminster, S.W.1

• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, Chairman and Treasurer; G. O. HAYS, President; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Controlled Circulation Audit, Inc.; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1949 by the Penton Publishing Co.

Editorial Staff on Contents Page

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 124, NO. 23 JUNE 6, 1949

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

IRWIN H. SUCH
Editor

WM. M. ROONEY
News and Market Editor

JAY DEEULIS
Engineering Editor

J. D. KNOX
Steel Plant Editor

GUY HUBBARD
Machine Tool Editor

DON S. CADOT
Art Editor

ALLEN G. GRAY
Consulting Editor

ASSOCIATE EDITORS

W. J. CAMPBELL • FRANK R. BRIGGS
VANCE BELL • WALTER F. TOERGE
DAN REEBEL

ASSISTANT EDITORS

HENRY J. HOLTZ • DOLORES K. BLAHA
JOHN S. MORGAN • L. J. SKUDERIN
EDWIN L. KARPICK • M. T. BORGERHOFF

RESIDENT EDITORS

E. C. KREUTZBERG
Washington Editor

B. K. PRICE
Eastern Editor, New York

L. E. BROWNE
Associate Editor, New York, Boston

J. C. SULLIVAN
Pittsburgh Editor

A. H. ALLEN
Detroit Editor

E. F. ROSS
Chicago Engineering Editor

HOWARD C. TUTTLE
Chicago News and Market Editor

VINCENT DELPORT
European Editor, London

EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC L. HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
BERT D. LYNN, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*
HERBERT GROSS, *Dusseldorf, Germany*

MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICES

New York 17 ..... 16 East 43rd St.
Murray Hill 2-2581

Chicago 11 ..... 520 North Michigan Ave.
Whitehall 4-1234

Pittsburgh 19 ..... 2806 Koppers Bldg.
Atlantic 3211

Detroit 2 ..... 6560 Cass Ave.
Madison 3024

Washington 4 ... 1123 National Press Bldg.
Executive 6849

Los Angeles 28 ..... 1452 N. Seward St.
Hudson 2-4439

London .. 2 Caxton St., Westminster, S.W.1

Business Staff on Page 4

NEXT WEEK . . .

Sheet Metal Operations Make Parts in Short-Run Lots

Efficient Handling Methods Can Cut Production Costs—VI

Production of Hot and Cold Rolled Strip and Sheet—II

Hot Wire Drawing Process Eliminates Repeated Annealing

NEWS

★ As the Editor Views the News 63
★ News Summary 67
Industry Subsidy Support Plan Simmers 69
Union Shop Clause Barred 71
Freight Absorption Approved 72
Banner Industrial Safety Year in 1948 73
Foundryman Optimistic on Business Prospects 74
U.S. Plans Trade Fairs 74
Machine Tool Builders Hopeful 75
★ Windows of Washington 76
Reactions Mixed on Europe's Capital Expansion 79
Republic's High-top Pressure Furnaces of Worldwide Interest 80
★ Calendar of Meetings 81
★ Mirrors of Motordom 83
New Plant in Production for Farval Corp. 86
★ Briefs 87
★ The Business Trend 88
★ Men of Industry 90
★ Obituaries 95
★ Construction and Enterprise 176

TECHNICAL

★ Engineering News at a Glance 97
Purdue University Machine Tool Laboratory 98
★ Seen and Heard in the Machinery Field 104
How Boron Affects Steel Hardenability 105
Production of Hot and Cold Rolled Strip and Sheet—I 106
Phosphate Coating Treatment Ups Cold Drawn Tubing Output 118
Ingenuity in Press Operation Affords Fabrication Savings 120
★ Progress in Steelmaking—Oxygen in Electric Furnace Practice 126
★ New Products and Equipment 141
★ Helpful Literature 149

MARKETS

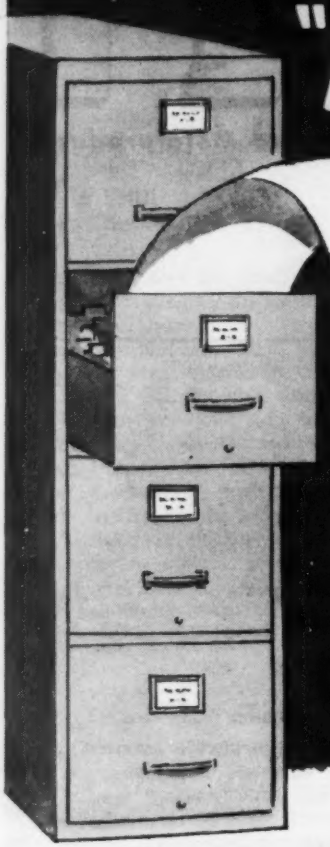
★ Market Summary 151
★ Market Prices and Composites 152
Zinc Prices Decline Further 156

★ *Advertising Index* 182

Editorial Index available semiannually; STEEL also is indexed regularly by Engineering Index Inc., 29 West 39th St., New York 18

★ Denotes Regular Features.

"RELIANCE OK"..P.A.



"The steel just received is a life-saver. This is not the only time you helped us out of a deep hole."

Quotation Reproduced From A Letter in Our Files

Steel Plentiful or Scarce . . Reliance Service Clicks with Sheet and Strip Steel Buyers

DEPENDABLE DAN
OUR CUSTOMERS' MAN

Here is Reliance Service in action from the P. A's angle . . . in his own words.

"We feel we have been given a fair share of materials . . ." "Your steel is preferred by the men in our shop" . . . "Your service far above the average warehouse in this area" . . . "Your timely assistance kept our plants operating" . . . "You have been doing everything possible under present conditions" . . . "In a pinch we can depend on Reliance coming through" . . . "You have gone all-out" . . . "You helped us out of a bad situation." . . . etc. . . . etc.

Reliance is constantly planning and working toward greater production and supply . . . towards higher standards of steel service.

DETROIT STEEL CORPORATION

PRODUCERS OF
COLD ROLLED STRIP STEEL

DETROIT 9, MICHIGAN
NEW HAVEN 7, CONNECTICUT

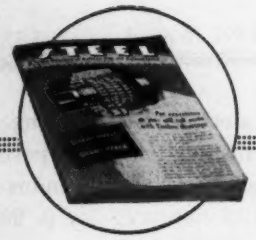
RELIANCE STEEL DIVISION

PROCESSORS AND DISTRIBUTORS JOB-FITTED SHEET AND STRIP STEEL

General Office: 1025 South Oakwood Ave., Detroit 25, Mich.
Plants: Chicago Cleveland, Detroit, New Haven
Sales Offices: Grand Rapids, Indianapolis, Lansing, Mich.
New York, St. Louis, Toledo, Worcester

★ ★

Products: COLD ROLLED STRIP STEEL—Coils and Cut Lengths . . . Slit or Round Edges . . . All Tempers . . . HOT ROLLED PICKLED STRIP STEEL—Cut Lengths . . . SHEETS—Hot Rolled . . . Hot Rolled Pickled . . . Cold Rolled . . . Long Terne . . . Galvanized.



June 6, 1949

Road To Ruin

Not long ago the Truman administration submitted to Congress a novel agricultural price support plan. Under this proposal prices of farm products would be permitted to seek their own levels through the normal play of supply and demand, but farmers would be subsidized to the extent these natural prices fall below a figure necessary to maintain a predetermined standard of farm income.

The advocates of this so-called Brannan plan believed it would be attractive to almost everybody. Consumers would enjoy low prices. Farmers would be insured of steady, high income. The only serious objectors would be the largest taxpayers. Notwithstanding these views of the sponsors of the Brannan plan, public response to it has not been enthusiastic or even cordial. Most farmers are suspicious of it, largely because it would entail a degree of regimentation that would be almost unbearable.

In spite of this cool reception, the planners in Washington now are working on an adaptation of the Brannan plan for industry. In this case, the authors of the plan propose that the government fix a price—for steel sheets, for example—which the wise men in Washington believe would attract buyers in sufficient volume to support production at the rate required to provide "full employment." Sheet mills would sell at this price and the government would give them enough additional money to enable them to make a "fair" profit.

Here again consumers would enjoy low prices, sellers would be guaranteed a profit and employees would be assured steady jobs. Sponsors cannot estimate the cost; in their opinion it is unimportant.

On this point all thinking citizens will disagree. Cost is important. Prohibitive as the cost in money might prove to be, it would be a minor factor compared to the cost in lowered morale. Under these plans, the harder one worked, the more heavily he would be taxed to subsidize the slackers. Soon it would become more profitable to be inefficient or even to loaf than to be efficient and to work hard. Everybody would be subject to bureaucratic control from Washington.

If the Truman administration were seeking a sure means of ruining the nation, the Brannan formula is the answer. It would bring ruin within a decade.

* * *

NEW MOVE ON PRICING: For many months sellers, distributors and buyers of steel have been confused by the government attitude on pricing methods. Action of the Supreme Court in several cases made it apparent that the old multiple basing point system of pricing was illegal. Most sellers shifted over to mill pricing, after which both sellers and buyers anxiously awaited clarification, either from the Court or by the Congress.

For some time the hope of industry for a removal of uncertainties rested on the Myers bill, which would have provided for a one-year truce in anti-trust law prosecutions in cases involving freight absorption and delivered prices where no conspiracy was shown. This bill ran into opposition and in a surprise move Senator O'Mahoney introduced a bill which legalizes basing point and delivered pricing in the absence of collusion.

This bill was passed by the Senate last week. It now goes to the House, where it may encounter opposition. The O'Mahoney bill is permanent legislation and as such is much preferred to

(OVER)

AS THE EDITOR VIEWS THE NEWS

the Myers bill, which was primarily a stop-gap measure intended to give the government time to clarify the pricing situation.

Most sellers and buyers of steel are reluctant to comment on the O'Mahoney bill until they have had a chance to study it and until it actually becomes law. However, if passed, it will have great influence in shaping price policies in the future. —p. 72

* * *

LOSSES FOR EVERYBODY: Now that the Ford strike is over, it is possible to assess the gains and losses. Striking employees lost a minimum of 16½ days' wages. Many lost more. In addition, thousands of employees in suppliers' plants, whose only concern in the feud at Ford was that of innocent bystanders, lost heavily in wages.

Ford Motor lost production of 100,000 cars and trucks, valued at around $110 million. Suppliers lost about $70 million in Ford purchases. Steel output at the Rouge steelworks was reduced by 100,000 tons. Ford dealers handling Ford-Mercury-Lincoln products helplessly watched thousands of prospective customers turn to General Motors, Chrysler or other dealers for their 1949 cars or trucks.

In short, the Ford strike was not won by anybody. It was lost by everybody. When our young, impetuous employees gain more experience, they will understand that a strike arising out of a dispute over relatively minor issues never is profitable for anybody. —p. 83

* * *

MODERN SCHOOL SHOPS: Thousands of men in the metalworking industries who graduated from engineering schools 20 years or more ago remember that the shops and laboratories of their undergraduate days were equipped largely with outmoded machines. These men would be amazed at the variety, quality and up-to-dateness of the equipment now to be found in some of the leading technical universities.

For instance, Purdue University recently replaced an obsolete machine shop with a completely modern laboratory. With the aid of surplus property, it has revamped its shops into a modern plant layout, in which the equipment is valued at $2 million.

This tendency of engineering schools to afford students an opportunity to study in school shops and laboratories equipment which resembles more closely that which they will encounter when they take up jobs in industry is an encouraging indication that the nation's educators in the engineering field are alert to the challenge that their facilities for instruction keep pace with the rapid progress of the nation's industries. —p. 98

* * *

SEE END OF DOWNTREND: From two independent sources come predictions as to when the present downward trend in business will be reversed.

At the annual convention of the Edison Electric Institute at Atlantic City, Elmer L. Lindseth, president of Cleveland Electric Illuminating Co., predicted that business will continue to decline until about a year from now "when the curve will be on the way up again."

A majority of purchasing agents polled by the National Association of Purchasing Agents is even more optimistic. In their opinion, the end of the downtrend will come in August or September and a gradual improvement will be experienced in the final quarter of 1949. One factor which contributes heavily to the purchasing agents' prediction is their belief that the present drive to reduce inventories to realistic levels will be completed in the third quarter, necessitating a resumption of buying for current needs in the fourth quarter. —p. 70

* * *

BANNER YEAR IN SAFETY: In a world which seems to be prone to make almost every proposal a subject of bitter controversy, it is refreshing to comment on a topic on which there is universal agreement. No sane person opposes the safety movement.

National Safety Council hails 1948 as a banner year in accident prevention. Last year's industrial injury rates show a substantial reduction in frequency and in severity of accidents as compared with those of 1947. Accident frequency rate for all industries was reduced 13 per cent. Leaders in the lowest frequency rates in 1948 were first, communications industry; second, aircraft manufacturing; third, electrical equipment manufacturing; and fourth, the steel industry.

Few persons are fully aware of the economic significance of a high degree of safety in industrial operations. Reduction of accidents through systematic safety programs saves the nation almost as much as our politicians waste in reckless expenditures. —p. 73

E. L. Shaner

EDITOR-IN-CHIEF

UNIVERSITY OF MICHIGAN LIBRARIES

News Summary

SUBSIDIES FOR INDUSTRY?—A support plan for industry, modeled after the Brannan farm support program, is in the discussion stage in Washington planning circles (p. 69). Plan involves subsidies for certain basic industries, such as steel, coal, lumber, petroleum and cement, should a serious recession develop. Advocates hold that the expenditures of the billions the plan would cost would be justified by prevention of widespread unemployment and suffering.

BUSINESS WEATHER—Purchasing agents see an end of the current downtrend in business activity by August or September (p. 70). They believe that inventory reduction will be accomplished during the third quarter and that buying then will be resumed . . . Utility executives anticipate further declines in activity, but believe the trend will be upward again within a year (p. 70) . . . Machine tool builders (p. 75) are hopeful of an upswing in orders next fall, when automotive retooling starts and ECA funds totaling $75 million for purchase of tools become available.

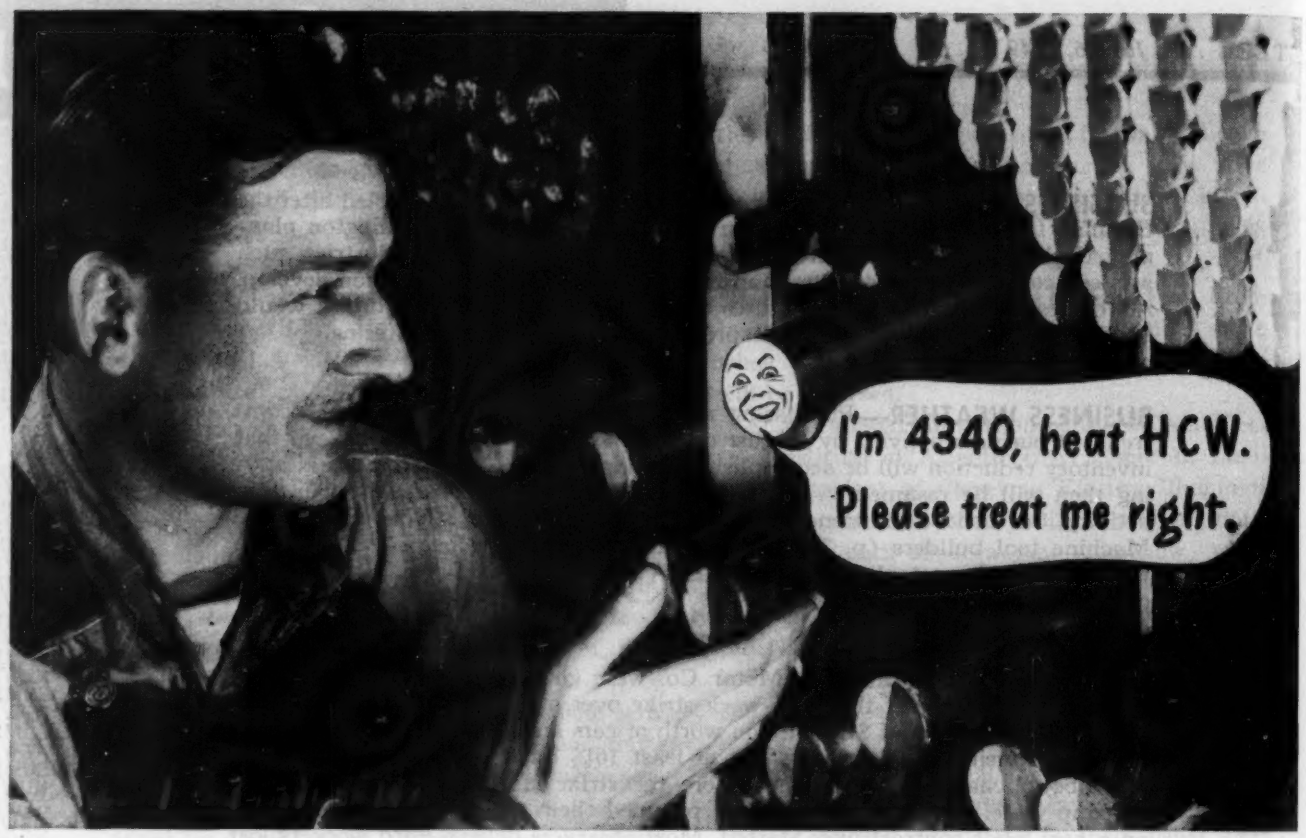
LABOR—Operations at Ford Motor Co. were gaining momentum last week following settlement of the three-week strike over a speedup grievance (p. 83). Ford lost production of $110 million worth of cars and trucks, suppliers lost $70 million in business and workers lost at least 16½ days' wages. Settlement was just about what Ford suggested before the strike started—arbitration of the speedup issue. Before operations had resumed their normal pace, negotiations on a new labor contract were started. Most observers believe Ford workers lost much of their bargaining power through the May stoppage . . . National Labor Relations Board has ruled (p. 71) that the union-shop clause in current agreement between captive coal mine operators and the miners is illegal under Taft-Hartley Act. Steel wage negotiations will start next week.

PRICING—Permanent legislation to legalize basing point and delivered pricing in the absence of collusion was approved last week by the Senate (p. 72), as a substitute for the Myers proposal for a moratorium on antitrust law prosecutions in cases involving freight absorption. Measure still must be acted upon by House, where it may encounter opposition. If the measure is finally approved, it remains doubtful whether steel sellers will absorb freight to the same extent they did formerly.

SAFETY—Industry had a banner year in 1948 as far as safety was concerned (p. 73). Substantial reductions were made in both frequency and severity of accidents as compared with 1947.

FOREIGN—European countries with colonies are looking somewhat skeptically at President Truman's Point Four program to aid in the development of backward areas (p. 79). While realizing that only the United States is in a position to finance this development and knowing that such development will create new markets, they still are suspicious that the program may be the means by which the United States will attempt to capture the colonial markets. Europe is becoming increasingly conscious of markets, as result of continuing capital expansions and the development of a buyers' market for many commodities.

HERE AND THERE IN INDUSTRY—Farval Corp., maker of centralized lubricating systems, has started production at its new plant in Cleveland (p. 86) . . . Construction contract for General Motors technical center has been awarded (p. 84) and will be completed over the next three years . . . High-top pressure blast furnace blowing fascinates foreign steel men visiting this country (p. 80) . . . Scrap will be exported to Mexico, Chile and other western hemisphere consumers (p. 78) . . . Granite City Steel has awarded contract for a new 185-ton open hearth furnace to Rust Furnace Co. (p. 86) . . . At least two cities will attempt to bring world trade fairs to the United States next year (p. 74). Canada's fair, opened last week at Toronto, attracted exhibitors from 35 nations.



If Alloys Could Talk . . .

If alloys could talk—could correctly identify themselves, state their hardenability, their mechanical properties and their best working temperatures—the tasks of specifying, buying and heat treating would be greatly simplified and virtually mistake-proof.

Although we stock no talking steels, we put Ryerson alloys through conclusive hardenability tests—literally make every heat in our stocks reveal every essential fact about itself. Then we carefully record the information on a Ryerson Alloy Certificate delivered with the steel.

Because we make our alloys tell all, you're able to specify and buy the safe way—on the basis of hardenability. Because we send a Ryerson Alloy Certificate with every shipment, your heat treaters are provided with the information they need to do a quick, accurate job.

Large stocks of Ryerson certified alloys are in stock for immediate delivery. When you want quick shipment of any alloy requirement call your nearest Ryerson plant.

—o—

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished

STAINLESS—Allegheny metal plates, sheets, bars, etc.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Sheared & U. M., Inland 4-Way Floor Plate

TUBING—Seamless & welded mechanical & boiler tubes

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal working

RYERSON STEEL

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco

STEEL
A PENTON PUBLICATION

Industry Support Plan Simmers

Group in executive branch of government toying with subsidy scheme adapted from Brannan farm support proposal as means of fighting serious deflation

SIMMERING in a group of planners in the executive branch of the government is a scheme to fight serious deflation—should such a condition again materialize—with an industry-support scheme adapted from the Brannan farm-support plan now before Congress.

While still in the talk stage, it could be wrapped into a package almost over night and launched into the gaze of the public. The plan merits scrutiny now in view of the tendency over recent years for today's radically new idea to become the law of the land tomorrow.

Would Cost Billions—The plan is one that would win wide support—for its objective is to prevent widespread unemployment and misery. It would cost billions of taxpayers' money, but proponents of the plan do not regard that as a deterrent. They think it would be cheaper and better to subsidize industry to the extent of several billions than to risk human suffering and disagreeable consequences that would attend a real business cataclysm.

Under the plan, certain industries would be selected as "basic"—industries producing such widely utilized materials as steel, coal, lumber, petroleum, cement, and the like. By subsidizing these basic industries the entire economy would get a shot in the arm.

Support Price—Take a product like steel sheets, used by countless manufacturers to produce thousands of different products. Suppose the big brain at Washington, in the event of a buyers' strike, decided that buyers would again take hold if the price were dropped 1 cent a pound to 2.35c base mill for hot-rolled. The sheet producers would be told to sell at this level, and they would be paid a support price to cover the cost and give them a fair profit.

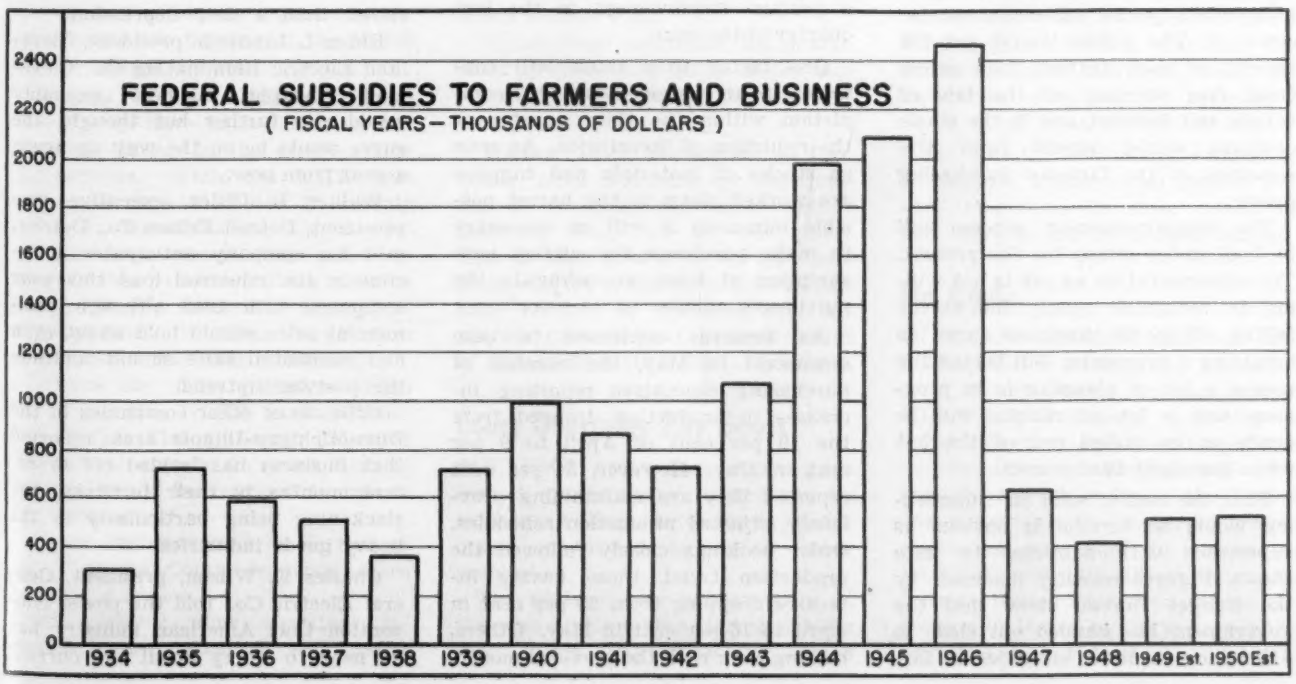
The scheme does envision the inclusion of "fair" profits to the basic industries for it is realized in Washington that private industry cannot contribute to a healthy economy without profits. How big these profits should be is a question, but the trend of thinking is that the formula should be cast with the needs of an expanding industrial plant in mind. Roughly, the approach of the Office of Price Administration in determining allowable profits when setting ceiling prices in World War II might be a precedent.

An understanding of the Brannan farm support plan is helpful in trying to determine what the planners have in mind for the support of industry, for the Brannan plan has been all worked out excepting for the detail as to just how many billions it might cost.

Brannan Formula—In the Brannan formula, you first calculate an "income support standard." For 1950 this would be "the level of cash returns for farm products which is equivalent in purchasing power to the average annual purchasing power of cash receipts from farm marketings during 1939-48." By dividing cash receipts by the index of prices paid, $18,218,000,000 is found to be the average purchasing power over this period.

Next, the income support standard for 1950, is found by multiplying average purchasing power by the index of prices paid for 1950 (assuming that the index for 1950 will be 144, or the same as in March of 1949). Multiplying $18,218,000,000 by 1.44 gives an income support standard of $26,234,000,000—which is the amount of money farmers must receive from farm marketings in 1950 in order to have cash purchasing power equal to the average purchasing power of recent years.

Support Level—Finally, the income support standard is translated into "price support standards" for individual farm products. This is done by dividing $20,980,000,000 (estimated average annual cash receipts over the past 10 years) into $26,234,-



000,000 which comes to 1.25. Multiplying this figure and the average prices over the past 10 years determines the support level for each product.

For illustration, the wheat price averaged $1.50 per bushel in 1940-49. Multiplying $1.50 by 1.25 gives $1.88, the 1950 wheat price support standard under the Brannan formula.

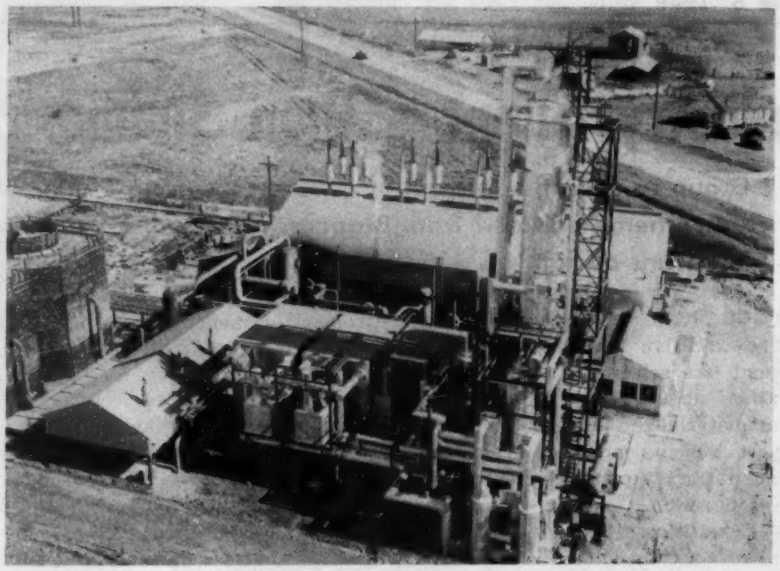
What do farmers think about the Brannan plan? Well, the fact that it provides income support standards which are about 15 per cent lower than the actual cash receipts from farm marketings in 1948 may have something to do with the way they feel. Again taking wheat, they like the parity price of $1.95 instead of $1.88 which they would get under the Brannan plan. A leading farm journal reports almost universal farmer objection to the Brannan farm support program for these reasons:

1. It would regiment farmers to a far greater degree than ever before;
2. It would cost taxpayers too much and they would rebel;
3. It would make farmers dependent upon Congress for a large part of their income, "a highly dangerous spot for a minority to be in";
4. It would substitute subsidized low prices for fair prices in the market place, and fix a low-price food policy on the country;
5. It would be a big step toward the "welfare state" in which the government tries to take care of everybody and everything.

Think Opposition Would Fade—But Brannan plan advocates think farmer opposition will disappear if times should get really bad. They see these two big merits to the plan in case of another period of depressed income: 1. The public would get the benefit of rock bottom food prices from free working of the law of supply and demand, and 2. the whole economy would benefit from preservation of the farmers' purchasing power.

The industry-support scheme will be kept under wraps for the present. The administration as yet is not willing to recognize openly the recent falling off in the business curve as heralding a depression. But behind the scenes a lot of planning is in progress—and a lot of rabbits will be ready to be pulled out of the hat when the right time comes.

That the cost of such an undertaking would be terrific is obvious as experience with subsidies to date shows. Figures recently disclosed by the Budget Bureau show that the government has handed out close to $15 billion in direct subsidies to farmers and business in the past 15 years and may dole out another half billion by July 1, 1950. The record of government direct subsidy expenditures over the past 17 years, 1949 and 1950 being estimated, is shown in the graph on page 69.



OXYGEN PLANT: High-purity, low-cost oxygen for industry is now being produced at a rate of 175 tons a day at the new plant of the McCarthy Chemical Co. at Winnie, Tex. The plant, shown above, was engineered and built by Stacey-Dresser Engineering of Cleveland

See End of Business Drop

END of the downtrend in business in August or September is expected by a majority of purchasing agents polled by the National Association of Purchasing Agents, New York. This will be followed, they believe, by a gradual improvement in the last quarter of the year.

One factor they think will contribute to an improvement is the completion within the third quarter of the reduction of inventories. As soon as stocks of materials and supplies are worked down to the barest possible minimum it will be necessary to make purchases for current consumption at least, according to the purchasing agents.

As business continued to ease downward in May, the number of purchasing executives reporting increases in production dropped from the 19 per cent of April to 9 per cent in May. However, 54 per cent reported they are maintaining previously adjusted production schedules. Order bookings closely followed the production trend, those having increases dropping from 23 per cent in April to 16 per cent in May. Others, holding even with the previous month, amounted to 47 per cent, highest number since November.

Cautious on Business Outlook

OPINION with respect to the business outlook is cautious among electric utility executives, it was indicated at the annual convention of the Edison Electric Institute in Atlantic City, N. J., last week.

Some executives were of the opinion business would slip further and that it may be a year before it starts to move upward again. Others said they thought the nation was headed for more normal conditions, rather than a deep depression.

Elmer L. Lindseth, president, Cleveland Electric Illuminating Co., Cleveland, thought business probably would slip further but thought the curve would be on the way up again a year from now.

Walker L. Cisler, executive vice president, Detroit Edison Co., Detroit, said his company anticipates a decline in its industrial load this year compared with 1948 although commercial sales should hold about even and residential sales should continue the postwar uptrend.

Officials of other companies in the Ohio-Michigan-Illinois area reported that business has leveled off in recent months in their territory, the slackening being particularly in the heavy goods industries.

Charles E. Wilson, president, General Electric Co., told the power convention that American industry has no need to worry about the current

decline in business, that there is nothing drastic about it, and nothing permanent. He predicted industrial production may again equal the post-war high registered in 1948 and that the current decline should not continue beyond second quarter of 1950.

Speaking of his own industry, Mr. Wilson said he expects production of consumer goods, such as ranges, refrigerators, washers, etc., to be cut at least 20 per cent by the end of this year compared with 1948 and that output of heavy goods would be 10 per cent lower.

Union Shop Clause Barred

Labor Relations Board holds captive mine agreements illegal under Taft-Hartley

THE union shop agreements which John L. Lewis forced upon steel company operators of captive coal mines under pressure of a strike last year are illegal, according to a National Labor Relations Board ruling. The NLRB directed Mr. Lewis to abandon the union shop clause and not to instigate or encourage strikes to compel employers to agree to such unlawful clauses.

While the decision was directed only toward the captive mines, all agreements between coal mine operators and the United Mine Workers contain the condemned clause.

Under the Taft-Hartley act, union shop agreements are permitted only after a majority of employees have voted for such clauses in an election held under the auspices of the NLRB. The United Mine Workers cannot ask for such an election because they have refused to sign the non-Communist affidavits required by the law before the benefits of the NLRB can be offered the union.

Appeal Likely—Actually the decision may have little effect on the security clauses in the captive mine agreements. While the UMW was given 10 days in which to comply with the board's order, appeal procedure may permit the union to stretch this period out to a year or more. In the meantime, new labor-management relations legislation could make the issue academic.

Unless the union complies within 10 days, the NLRB may petition the United States Circuit Court of Appeals to enforce its order. Several months would be required to review the case.

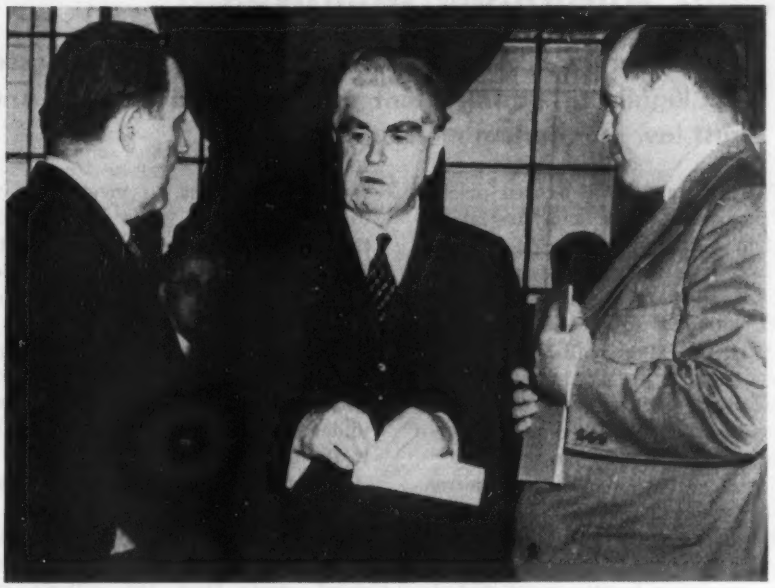
Later the case may be carried to the Supreme Court, requiring more months of review.

The captive mine operators inserted a stipulation in last year's agreement making the union shop clause conditional on a ruling by the "court of last resort."

May Complicate Negotiations — While the board's ruling will not affect the contracts expiring June 30, it may complicate negotiations for a new contract. Mr. Lewis is reported to be preparing to present some costly demands to the mine operators, including a shorter work-week, with no decrease in weekly pay, and a substantial increase in the operators' contribution to the union welfare fund.

Under these conditions, the miners' security issue may come in for considerable debate during the new contract negotiations.

Welfare Fund Inadequate — Currently, mine operators are contributing 20 cents to the union welfare fund for every ton of coal mined. This is used primarily for pay pensions of $100 a month to miners who have reached 60 years of age. Actuaries contend that a contribution of around 50 cents a ton is necessary.



LEWIS STALLS: United Mine Workers President John L. Lewis stalls for time in his negotiations with the southern coal operators, hoping to win a settlement with northern captive mine owners first. Shown at sessions at Bluefield, W. Va., are, left to right: Laurance E. Tierney, president, Eastern Coal Corp.; Mr. Lewis; and Joseph E. Moody, president, Southern Coal Producers Association. NEA photo

Court Overrules Pay Boost

SUPREME Court last week ruled that a pay increase offered to its workers without notification to the union constitutes an unfair labor practice.

The decision was handed down in the case of Crompton-Highland Mills Inc., Griffen, Ga., which had offered the pay boost during deadlocked negotiations with the CIO textile union.

The court said that if the increase had been offered to the union and rejected then it might have been in effect without "carrying any disparagement of the collective bargaining proceedings."

Miners Ask Action on Safety

NEW and more strict safety regulations to protect miners was demanded of a Senate labor subcommittee last week by John L. Lewis, United Mine Workers president. The miners expect Congress, said Mr. Lewis, to carry out its promise to enact tougher safety legislation.

He was the concluding witness on a measure which would permit federal inspectors to close mines on the basis of an "imminent danger."

Up Again

CIVILIAN EMPLOYEES of the United States government numbered 2,111,257 in March compared with 2,104,979 in February, according to latest report of the Joint Committee on Reduction of Nonessential Federal Expenditures. Inside the United States, increase in number of federal employees was 8597 in March—to 1,919,723 from 1,911,126 in February. Outside United States employees decreased in March by 2319—to 191,534 from 193,853 in February.

Freight Absorption Approved

Steelmakers and consumers view favorably Senate passed bill legalizing basing point and delivered pricing. Anti-trust law moratorium measure scrapped

BASING point and delivered pricing in the absence of collusion are labeled legal in a bill which passed the Senate last week as a substitute measure for the Myers moratorium bill which had run into considerable opposition. The Myers bill had proposed a one-year truce in anti-trust law prosecutions in cases involving freight absorption and delivered prices where no conspiracy was shown.

The substitute measure is permanent legislation. It was introduced by Sen. Joseph C. O'Mahoney (Dem., Wyo.), and was passed by voice vote, stamping basing point and delivered pricing legal so long as sellers act independently and not in collusion.

The bill now goes to the House for action where it may run into some opposition.

Amend Anti-Trust Laws—The Myers' moratorium bill, which had been approved in committee, and which aimed to provide Congress time in which to thoroughly study the pricing problem, ran into considerable opposition since it was felt permanent legislation was needed now. Senator O'Mahoney offered amendments to the Federal Trade Commission and Clayton Acts permitting sellers to quote delivered prices and to absorb freight provided they act independently and there is no conspiracy or collusion.

The O'Mahoney bill specifically permits sellers, acting independently, to quote identical delivered prices at different points. It permits sellers to absorb freight to meet competitors' prices, and "this may include the maintenance, above or below the price of such competitor, of a differential in price which such seller customarily maintains."

Price Is Defined—A price, as defined in the new law, is any price which has the meaning which it has under the commercial law applicable to the transaction.

The term "delivered price" means a price at which a seller makes or offers to make delivery of a commodity to a buyer at any delivery point other than the seller's own place of business.

The term "absorb freight" means to establish for any commodity at any delivery point a delivered price which, although as high as, or higher than, the seller's price for the same commodity at the point from which such commodity is shipped, is lower than the sum of the seller's price for such commodity at such point of shipment, plus the actual cost to the seller for transportation of such commodity from such point of shipment to the delivery point.

The term "the effect may have" means that there is a reasonable probability of the specified effect.

Myers Bill Scrapped—Just how long it will take for the House to act on the measure is uncertain. One thing is clear, scrapping of the Myers measure removes the uncertainty in business circles as to the effectiveness of any temporary law.

Immediate reaction in the steel industry to the passage of the O'Mahoney substitute measure by the Senate was not forthcoming. For the most part steelmakers are inclined to withhold comment pending study of the bill and action on it by the House. Generally, however, the view prevails that the O'Mahoney measure comes closer to solving the problem than does the Myers bill. Some observers are of the opinion that the bill, if finally enacted into law, not only will clarify a highly muddled pricing situation but also will provide a sound economic procedure of pricing in the steel industry.

Some observers point out, however, that even though freight absorption is permitted in the future it is unlikely steel producers will absorb freight to the same extent they did before because of high freight rates.

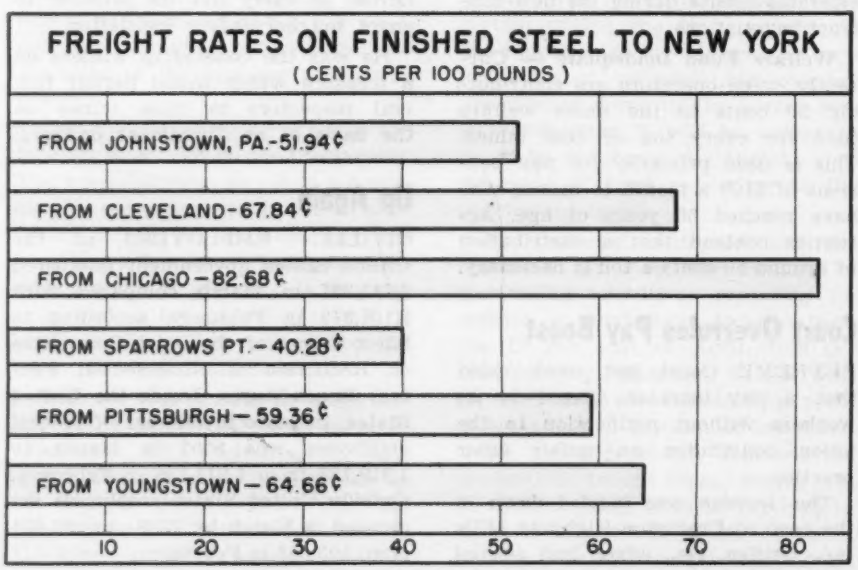
Some smaller steel sellers, it will be recalled, have continued to absorb freight right along in meeting competition, never having abandoned basing point pricing. Over recent months, with return of keener competition, a number of such interests have begun to equalize freight. Outstanding in this respect has been the Kaiser Co. which announced some weeks ago it was absorbing freight to certain points.

Effect of f.o.b. mill pricing on the various markets only now is coming into clear perspective. Ever since basing point pricing was abandoned almost a year ago sellers have had little difficulty in disposing of their products because of the scarcities which have existed. Now that supplies are becoming increasingly surplus sellers are finding it difficult reaching out beyond home markets.

Warehouses Affected—Steel warehouse operators currently are expressing concern over the way the new pricing system is affecting their business.

Speaking for eastern warehouse interests recently, Peter Capio, Bushwick Iron & Steel Co., Brooklyn, N. Y., said that f.o.b. pricing instead of increasing competition actually is making for monopoly in the sale of steel.

The accompanying chart, based on data provided by Mr. Capio, shows the disadvantages freightwise of New York area jobbers who must bring in their steel from distant points.



Prefer Basing Point Pricing

CONTINUED decline in steel buying is pointing up the effects of the mill pricing policy on both producers and consumers.

In the Baltimore area, for instance, with the largest tidewater steel plant

in the world, that of Bethlehem Steel Co. at Sparrows Point, close at hand, in addition to the Rustless Division of Armco Steel Corp. and Eastern Stainless Steel Corp., consumers are in generally good position as to supply. Yet there are products those companies cannot supply, and as to the majority of steel products, notably the carbon grades, there is but one local producer.

As a result many buyers in the Baltimore area say they would be happier if mills throughout the country were on a basing point system of pricing. Under such a system, they declare, they would have more sources of supply to choose from and without having to absorb full freight would be able to obtain certain items not supplied by local mills. Freight costs become increasingly oppressive to a consumer as demand for his product shrinks.

Baltimore area representatives of steel producers which do not have the freight advantages of the local mills naturally desire a return to the basing point system. With consumer demand down and prices a primary consideration, the representatives of distant mills are finding the going increasingly rough.

1948 INJURY RATES BY INDUSTRY

	FREQUENCY Disabling Injuries per 1,000,000 man-hours	% Change from 1947
Communications	2.60	—13
Aircraft Manufacturing	4.56	—36
Electrical Equipment	5.56	— 8
Steel	5.86	— 4
Cement	6.81	— 6
Chemical	7.51	—15
Railroad Equipment	7.58	— 6
Tobacco	7.72	+18
Rubber	8.35	— 8
Automobile	8.47	—16
Textile	8.79	0
Misc. Manufacturing	8.83	— 6
Service	9.00	—20
Glass	9.50	—13
Sheet Metal	9.75	—24
Printing & Publishing	9.83	—11
Shipbuilding	10.14	—34
Wholesale & Retail Trade	10.35	+ 8
ALL INDUSTRIES	11.49	—13
Nonferrous Metals & Prod.	12.14	—13
Petroleum	12.27	— 7
Storage & Warehousing	12.41	—29
Machinery	12.84	—11
Iron & Steel Products	13.96	+ 7
Electric Utilities	14.80	— 4
Air Transport	15.05	— 8
Pulp & Paper	15.15	—17
Leather	15.47	— 8
Construction	16.51	—32
Meat Packing	17.84	—20
Transit	18.01	—31
Food	18.10	—11
Quarry	19.07	+12
Clay Products	19.53	—19
Gas Utilities	19.93	—10
Foundry	21.06	—16
Woodworking	25.22	—16
Marine Transport	26.43	—12
Mining, Other than Coal	40.47	—20
Mining, Coal	46.09	—15
Lumber	49.04	—18

	SEVERITY Time Charges (in days) per 1,000 man-hours	% Change from 1947
Communications	.18	+13
Tobacco	.19	—21
Wholesale & Retail Trade	.22	+29
Printing & Publishing	.43	—33
Aircraft Manufacturing	.44	+ 7
Electrical Equipment	.45	0
Leather	.48	+50
Glass	.48	—27
Storage & Warehousing	.55	—44
Misc. Manufacturing	.56	+12
Textile	.58	+ 7
Meat Packing	.63	—16
Rubber	.65	— 7
Automobile	.65	— 2
Service	.82	+290
Machinery	.84	+ 2
Sheet Metal	.90	—13
Chemical	.90	— 2
Transit	.97	—29
Iron & Steel Products	1.02	+26
Food	1.09	— 6
Shipbuilding	1.11	—49
Gas Utilities	1.11	—11
ALL INDUSTRIES	1.12	— 9
Pulp & Paper	1.14	—18
Petroleum	1.16	—13
Railroad Equipment	1.26	+14
Nonferrous Metals & Prod.	1.30	—13
Woodworking	1.52	—23
Clay Products	1.58	—15
Steel	1.65	+ 3
Foundry	1.74	+29
Air Transport	1.88	—11
Electric Utilities	2.11	—12
Marine Transport	2.29	—19
Construction	2.51	— 5
Cement	2.72	— 4
Quarry	3.38	— 8
Lumber	4.64	—11
Mining, Other than Coal	6.37	+ 3
Mining, Coal	7.61	— 4

Banner Safety Year

Reported for industry in 1948. Frequency and severity of accidents reduced

INDUSTRY had a banner safety year in 1948, the National Safety Council reported last week. Last year's industrial injury rates show a substantial reduction in both frequency and severity of accidents as compared with 1947.

The accident frequency rate for all industries submitting company reports, based on the number of disabling injuries per 1 million man-hours, was 11.49 in 1948—a reduction of 13 per cent from the year before.

Communications Leads—The communications industry again led by turning in the lowest frequency rate. Its rate was 2.60—a 13 per cent reduction from 1947. The aircraft manufacturing industry was second with a frequency rate of 4.56, a reduction of 36 per cent. Electrical equipment was third with a frequency rate of 5.56, down 8 per cent from the year before, while the steel industry was fourth at 5.86, off 4 per cent from 1947 frequency rate.

Lumbering was at the bottom of the frequency list in 1948, with a rate of 49.04, but this represented a reduction of 18 per cent from the year before. Coal mining, which ranked next to the bottom of the frequency list in 1947, ended 1948 in the same position with a rate of 46.09—a 15 per cent reduction.

The accident severity rate for all industries reporting to the council, based on the number of days lost per 1000 man-hours, was 1.12 last year—a reduction of 9 per cent from 1947.

Communications again had the lowest severity rate, leading all other industries last year with a rate of 0.18—a 13 per cent increase over 1947. The tobacco industry ranked second in 1948 with a rate of 0.19, a reduction of 21 per cent from the previous year, when it was fourth.

Mining At Bottom—In terms of severity, coal mining once more stayed at the bottom of the list, with the highest accident severity rate of 7.61. But this was a 4 per cent reduction from 1947.

The complete 1948 injury frequency and severity rates by industries, as reported to the National Safety Council, are shown in the accompanying table.

Slag Production Hits New High

NEW HIGH in production of blast-furnace slag was set in 1948. Outturn was 21,131,000 net tons valued at $22,360,000, an 8 per cent increase over the 19,581,679 tons valued at $19,525,482 in 1947, according to statistics collected by the National Slag Association, Washington, and assembled in co-operation with the U. S. Bureau of Mines.

The major product, screened air-cooled slag, amounted to 17,656,200 net tons. Of this total, 15,477,400 tons were used as railroad ballast, aggregate for concrete and bituminous construction, and for other types of highway work. Rest of the screened, air-cooled slag was consumed in manufacture of mineral wool, roofing, concrete block, airport construction, agricultural uses, sewage trickling media, and for other uses.

Taconite Operations To Resume

ERIE Mining Co.'s taconite-processing pilot plant in Minnesota shortly will resume operations after a four months' shutdown for some change-overs of equipment.

The Erie Mining plant, which is operated by Pickands Mather & Co., Cleveland, was built and put into operation last year to extract iron from taconite. As a result of lessons learned in the first months of operation, changes in the process are being made.

Some of the pellets, assaying 65 to

70 per cent pure iron in contrast to 51 per cent for best grade Lake Superior ores, are being shipped to Youngstown Sheet & Tube Co., owner of 45 per cent of Erie Mining, for tests of methods of shipping and of charging the materials.

Foundryman Optimistic

Speaker at regional meeting of National Foundry Association says output is above prewar

SPEAKING before the regional dinner forum of the National Foundry Association at the Sheraton Hotel, Chicago, June 1, Stevens H. Hammond, president, the Whiting Corp., took an optimistic view of business conditions in the foundry industry.

"While production of gray iron, steel and malleable castings is off from last year, tonnages are still far above prewar levels," he said, adding that "the only difficulty results from the fact that foundries, like most other businesses, need greater volume today to earn a profit because of increased break-even points. Furthermore, wages and material costs are too high in relation to sales prices."

Cause For Concern—He indicated concern over what expansion had done to increase most companies' inventories, indebtedness and fixed assets, and, at the same time, decrease badly needed cash.

Mr. Hammond appealed to management to band together to lead the people to a new and better way of life.

E. B. Sherwin, president, Chicago Hardware Foundry Co., presided at the meeting which also featured a labor relations panel in which the participants were: John Waddleton, Allis-Chalmers Mfg. Co.; Harold E. Bruns, Hart Carter Co.; A. V. Martens, Pekin Foundry & Mfg. Co.; George E. Moredock, International Harvester Co.

L. E. Roark, association vice president, spoke on the Washington legislative outlook.

Coast Steel Expansion Continues

EXPANSION programs of all major southern California steel producers are unchanged, despite the rapidly shifting market outlook generally. Companies in the Los Angeles area believe that steady industrial growth of this district, continued increase in its population, and the freight savings on locally produced steel products, justify the expansion of western production and finishing capacity.

Columbia Steel Co. is proceeding with plans for its new sheet mill at Torrance. The company has purchased the site and buildings of a wartime Alcoa plant for this purpose. Dismantling of its aluminum production equipment is virtually completed, and Columbia's engineers are busy with plans for revision of buildings and installation of rolling mill equipment.

Bethlehem Pacific Coast Steel Corp. is going ahead with the installation of a new 75-ton electric furnace in its Los Angeles plant.

Kaiser Co. Inc. is pushing its extensive expansion program at Fontana, with the construction of new facilities several months ahead of schedule. Included are a new blast furnace, coke ovens, hot-rolled sheet mill, electric weld pipe mill, and soaking pits.

Household Washer Sales Drop

FACTORY sales of standard size household washers in April totaled 194,900 units, a decrease of 23.3 per cent from 254,300 in March, and down 51.5 per cent from 402,257 in April, 1948, according to the American Washer & Ironer Manufacturers' Association.

Factory sales of ironers in April aggregated 17,800, down 24.2 per cent from 23,500 in March, and a decrease of 62.3 per cent from 47,319 in April, 1948.

Benjamin F. Fairless

THE president of the U. S. Steel Corp. and vice president of the American Iron & Steel Institute was signally honored at the recent meeting of the institute when he was presented the Gary Memorial Medal for outstanding achievement in the iron and steel industry. This was the first time the Gary Medal, top industry honor, has been awarded since 1944. Only four others have received the medal. Presentation to Mr. Fairless was made by Eugene G. Grace, chairman, Bethlehem Steel Co.

U.S. Plans Trade Fairs

Disclosure made at opening of Canadian exposition. Atlantic City, Detroit seek expositions

THE United States may hold its first world trade fair in 1950. This was disclosed last week at the opening of the second Canadian International Trade Fair at Toronto.

Delegations from Atlantic City, N. J., and Detroit were on hand promoting similar expositions for their cities next year. Secretary of Commerce Charles Sawyer, who participated in the opening of the Canadian show, expressed belief that at least one such fair would be held south of the border next year. Half a dozen cities have approached his department with inquiries about trade fairs.

The promoters are encouraged by the success met by postwar European trade fairs. An institution of many years standing in the old countries, the fairs of the past three years have attracted more exhibitors and visitors than ever before.

35 Nations Represented — More than 600 exhibitors from 35 countries have their products in this year's Toronto show. Sixty per cent of the exhibits are from foreign countries and 40 per cent from Canada. Many of the latter are Canadian subsidiaries of American companies.

Leading exhibitors of metalworking products include Canada, the United States, United Kingdom, France, Switzerland and Czechoslovakia.

Commerce Heads Meet—The Canadian fair brought together for the first time since 1776 the commerce directors of the three major foreign trading nations. C. D. Howe, Canadian minister of trade and commerce, Harold Wilson, president of the United Kingdom Board of Trade, and Secretary Sawyer all stressed the importance of world trade as a means of combatting the industrial recession which has appeared in all three countries.

Secretary Sawyer pointed out that the greatest exchange of commerce between any two countries in the world flows across the Canadian-United States border. Last year, Canada bought nearly $2 billion in goods from the United States while the United States bought more than $1.5 billion from Canada. Heaviest

overseas trade of both countries is with the United Kingdom.

Machine Builders Hopeful

That flood of inquiries will bring business in latter part of this year. April orders drop sharply

CURRENTLY in the doldrums in company with most other manufacturing concerns, the machine tool builders are hopeful of an upswing in business in the fall of the year with many of them anticipating that the summer months will be slow. Basis of the expected revival in activity is the fact that there are a large number of inquiries being directed to both builders and dealers, indicating that the market is not dead but merely dormant for the present.

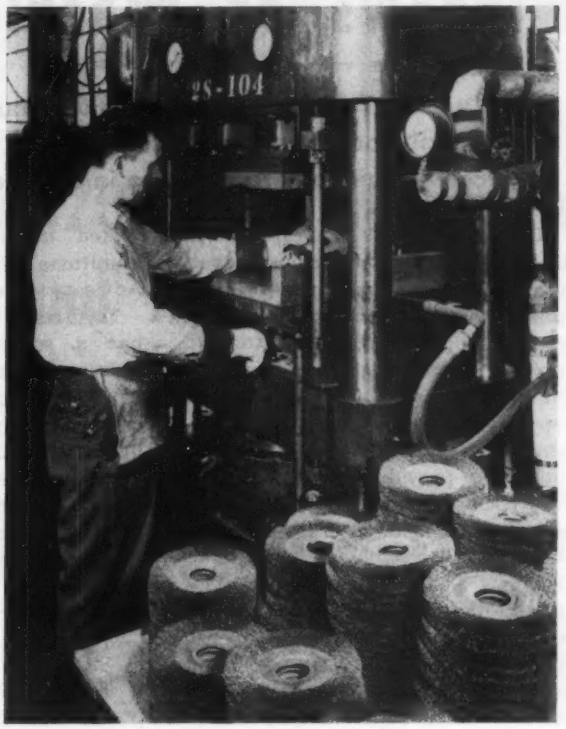
Retooling in the automotive industry is a big reason for the expected upswing at the end of the year. According to information coming out of Detroit some retooling is in the offing, but as yet, no one is sure how much business will come to the machine tool builders.

European Business—Another reason for optimism on the part of some builders is that Economic Cooperation Administration funds totaling $75 million have been approved for purchase of American machine tools in the fiscal year beginning July 1. This sum, although below some rosy estimates made in the past of the amount of European business that would come to U. S. builders, represents a substantial rise over last year's total. Clouding the picture, however, is the fact that a slump in European industrial activity will mean a dearth of new orders.

Despite the often expressed opinion that price cuts in machine tools would bring in little or no new business, at least one large eastern machine tool builder is reported considering trimming prices on a number of items to improve his competitive position. Other builders are studying the advisability of offering machines embodying fewer gadgets.

New Orders Down — Following an upswing in March, new orders for machine tools fell off sharply in April to an index figure of 69.8 per cent of average shipments for 1945-1947, a drop 23.7 points from the 93.5 per cent registered in the preceding month. The decline was all in the domestic market as April foreign orders rose slightly to 22.8 from 22.3 in March. April shipments were 74.4 per cent of the average for the base years, down slightly from the March figure of 75.8. All of the preceding index figures are compiled by National Machine Tool Builders' Association and are based on average monthly shipments for 1945-1947 being equal to 100.

NEW BRUSH: Production of a rotary wire brush with bristles imbedded in a rubber center has been started by Hewitt - Robins Inc., Buffalo. Developed by Alfred Flohr, Buffalo inventor, the rubber-locked brush is claimed to have increased service life, to be safer and to increase and improve production over the conventional rigid-base brushes



Tool Accessory Wages High

AVERAGE straight-time earnings of tool and die makers in machine tool accessory establishments ranged from $1.60 to $2.22 per hour in December among leading centers of the industry, according to the Bureau of Labor Statistics. Workers averaged over $2 in two cities, from $1.82 to $1.86 in five cities and less than $1.75 in three cities.

Earnings of other highly skilled workers studied by the bureau generally averaged slightly less than tool and die makers. Highest earnings levels in the ten cities for class A operators of engine lathes, milling machines, grinding machines and class A inspectors ranged from $2.11 to $2.19 and the lowest rates averaged from $1.42 to $1.53. Class B operators of these machines earned from 20 to 40 cents less per hour.

Earnings in nearly all jobs were highest in Detroit. Chicago and Cleveland rates ranked second.

Youngstown Alloy Erects Plant

YOUNGSTOWN Alloy Casting Corp. is building a $100,000 plant in Youngstown to house its steel foundry now in too small quarters. The company, making high grade alloy steel castings, has a heavy order backlog, mainly from Chicago district steel plants, and has been working six and seven days weekly to catch up.

Considerable new equipment will supplement present apparatus in the new plant.

Westinghouse Staff Changes

EXECUTIVE staff changes designed to provide more adequately for greatly expanded postwar activities and new product lines were announced last week by Westinghouse Electric Corp.

Vice President L. E. Osborne, primarily an operations official heretofore, has been assigned staff supervision over all of the company's manufacturing activities.

James H. Jewell, recently elected vice president, takes over staff supervision of all sales and marketing.

John K. Hodnette, vice president and head of the Transformer Division, becomes general manager of industrial products with headquarters at Pittsburgh.

John M. McKibbin, recently elected vice president and former head of advertising and sales promotion, is appointed general manager of consumer products with full line responsibility for operation of Appliance and Home Radio Divisions.

Assignment of Mr. Jewell as chief sales executive was made in view of the approaching retirement of Vice President B. W. Clark, who has served Westinghouse for 24 years.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Bill would aid aircraft components manufacturers to prepare to supply accessory equipment as fast as needed to keep pace with airframe production in event of war

IF THE MILITARY appropriations bill, as passed by the House, goes smoothly through the Senate as is expected, aircraft components manufacturers will get a big lift toward preparing them to supply accessory equipment as rapidly as needed to keep pace with production of airframes in a war. The Air Force appropriation provides for $11,648,371 to be spent on production preparedness in the field of aircraft components as follows:

Engines $3,430,672; propellers $1,219,619; fire-control systems $2,225,000; bombing system components $765,000; bomb sights $382,500; radio and radar $828,750; landing gear $433,500; turbo superchargers $178,500; test equipment $76,500; automatic pilots $137,700; instruments $114,750; ground handling equipment $65,880.

Also $435,000 for maintenance of existing preparedness measures on current contracts; $750,000 for perfecting resources requirements data on materials, manpower facilities, and machine tools requirements; $55,000 for studying protection of industry, including such items as underground plant locations; and $400,000 for purchase of engineering and technical services, including studies of new manufacturing processes.

The biggest item, $3,430,672 for preparing licensees to manufacture standard airplane engines, breaks down as follows: $825,000 to General Electric J-47 (jet) engines; $650,000 to Allison J-33 (jet) engines; $700,000 to Allison J-35 (jet); $800,000 to Pratt & Whitney J-48 (jet); $300,000 to Pratt & Whitney R-4360 (radial reciprocating); $155,672 for others.

Negotiations now are under way whereby Ford, Buick and Nash are to become prepared to produce the Pratt & Whitney R-4360.

All of the preparedness programs include provision for engineering redesign to permit high-volume production, operation planning of manufacturing processes, tool design and machine tool planning, plant layout, etc.

Heads Aircraft Committee

F. C. CRAWFORD, president, Thompson Products Inc., Cleveland, has been elected industry chairman of the Munitions Board Aircraft Industry Advisory Committee.

To further its work, the committee has a subcommittee studying the industry's relations to subcontractors, with particular reference to the mobilization program. This subcommittee's chairman is Malcolm P. Ferguson, president, Bendix Aviation Corp., Detroit. Other members are J. H. Kindelberger, president, North American Aviation Inc., Los Angeles; and J. Carlton Ward Jr., president, Fairchild Engine & Airplane Corp., Hagerstown, Md.

UP AND AT 'EM

ESCALATORS are becoming vital in the country's defense measures. The Navy noticed its air pilots, burdened with 40 pounds of clothing and equipage, were winded after rushing upward 28 feet from the "ready room" on the hangar deck to the flight deck of aircraft carriers. So Navy officials decided that for most efficient maintenance of a carrier's split-second takeoff schedule it would be smart to have moving stairways to carry the men so they would be in fresh condition when arriving at their planes. Result: The Navy has placed an order with Westinghouse Electric Corp. for installation of three escalators on carriers.

For Engine Standardization

PROBLEM of standardization of engines and parts will be examined by the new Munitions Board Industry Advisory Committee for Internal Combustion Engines, June 23 and 24 in Chicago.

Available to the committee will be lists from the Army Engineers, the Navy, and Army Ordnance showing sizes and types of industrial, automotive, and marine engines the armed services will require in the foreseeable future.

The committee, successor to a committee which had been studying industrial engines, has elected the same officers which served the earlier group. They are: Chairman, C. E. Nelson Jr., vice president, Waukesha Motor Co., Waukesha, Wis.; vice chairman, H. W. Smith, manager, engine sales department, Caterpillar Tractor Co., Peoria, Ill.; and secretary, G. Waine Thomas, chief engineer, Continental Motor Corp., Milwaukee.

Frowns on Move To Economize

RELATIVELY feeble efforts in this Congress toward economy are not receiving any administration encouragement — the administration attitude is that the President's budget request in January represented the maximum in economy.

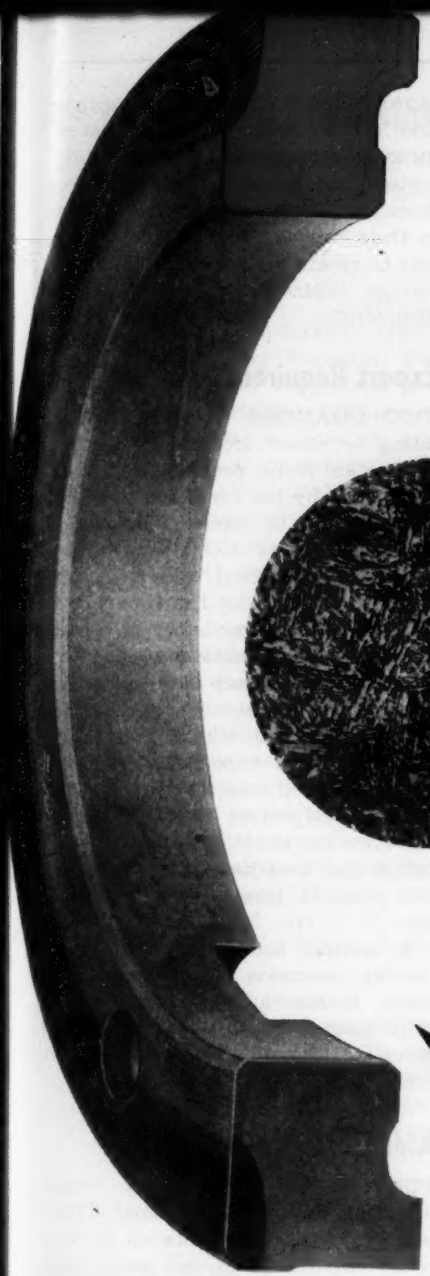
A striking reflection of the administration line was given when Secretary of Interior J. A. Krug recently appeared before the Senate Appropriations Committee with requests that the House cuts of $81 million in the Interior appropriation for fiscal 1950 be restored by the Senate.

The House cut included $56 million in the hope that construction costs would fall off 15 per cent. This hope is vain, Secretary Krug told the Senate committee; more than 80 per cent of the expenditures for construction in 1950 will have been obligated by July 1, 1949, he said, so that Interior will have to get the money pruned out by the House. Mr. Krug went on to ask for authorization of a new project not included in the long list authorized by the House—a transmission line in Montana.

Mr. Krug advanced impressive arguments for restoring the other cuts, coming to $25 million. The House economies applied to governing of the territories, the expansion program in Alaska, the land management program, Indian affairs, fish and wildlife service, mineral statistical work, National Park Service, soil conservation, work of the Geological Survey, etc. None of these activities can be carried on to the extent necessary for the national interest with less money than the President requested, he insisted.

Tax Speedup Bill Opposed

ALARMED by the Mills bill to speed up tax payments by corporations,



specified

This area to be hardened

production 120/hr-results uniform and 100% predictable

achieved

This surface structure RC58
(X600 2% nital etch)

by flamatic selective surface hardening

This clutch adjusting nut (8¼" OD, 5½" ID – SAE 1050) is Flamatic-hardened by **Rockford Clutch Division, Borg-Warner Corp.**, in less than 30 seconds – to a specified surface hardness (Rc58) – to a specified depth – and virtually to a specified microstructure.

Behind this ability of Flamatic hardening to duplicate these results in production are three simple facts:

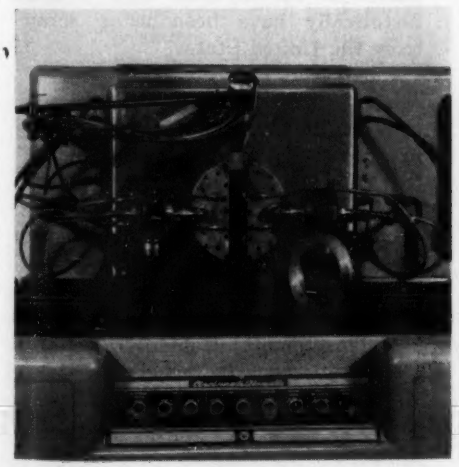
(1) Flamatic high temperature flames deliver heat to the part so rapidly that hardness can readily be confined to definite areas.

(2) Flamatic electronic temperature control maintains an absolute instantaneous measure of work piece surface temperature, permitting the part to be heated to within plus or minus 10° F of the specified value.

(3) Oil quench minimizes and often entirely eliminates distortion.

Gears, and similar parts up to 18" OD, shafts up to 24" long – simple or complex parts, many which cannot economically or uniformly be hardened by any other method – are all within Flamatic's capacity.

Send a description, sketch or print of any part you are now hardening, for analysis and recommendation. Interesting booklet of case histories (Publication No. M-1658) on request



After loading, Flamatic operation is fully automatic. Set up for a given part is easily done without special skill.

flamatic

THE CINCINNATI MILLING MACHINE CO

Cincinnati 9, Ohio, U. S. A. • CINCINNATI

the National Small Business Men's Association Inc. has asked for a full public Congressional hearing on the proposal.

In the request, DeWitt Emery, president of the association, told Rep. Robert L. Doughton, chairman of the House Ways & Means Committee, that this "latest piece of economic illiteracy and bookkeeping sleight of hand" would mean closing of many plants and a consequent increase in unemployment.

The measure, H. R. 4730, would compel corporations to pay all of their 1949 tax in the first six months of 1950.

The bill, said Mr. Emery, "is merely a subterfuge for transferring deficit spending from government to private enterprise and for not cutting the high cost of government as dictated by common sense economies." The bill would merely delay an increase in taxes, he pointed out.

If the 1949 corporate tax collectible in the last two quarters of 1950 were taken in beforehand and spent, what would be done to make up the deficit in federal revenue for the fiscal year of 1950-51, Mr. Emery asked. "Congress," he said, "either would have to cut the budget for 1950-51 by several billion dollars—which small business is for a hundred per cent—or increase taxes. But," he added, "it is obvious even now that the latter would be done."

The Mills speedup bill, if enacted, would compel the majority of smaller corporations to seek loans to keep their businesses operating, Mr. Emery asserted.

Seek Labor Extension Service

LITTLE public attention is being focused on the effort again being made to establish a labor extension service in the Labor Department. However, labor unions are fighting for this bill just as vigorously as for repeal of the Taft-Hartley Act. Object is to promote labor education for labor union officers and members; this would result from more and better courses of study at colleges and universities, and from establishment of extension services under which college professors and instructors would go to union locals all over the country to deliver classroom lectures.

Cost to the federal government of the setup the unions seek is estimated at $10 million a year, with states, communities, boards of education, colleges, etc., providing matching funds. The labor extension service would parallel the agricultural extension service, excepting that the latter spends $30 million annually in educating farmers.

At least 10,000 officials and members of CIO, AFL and independent unions will spend a week, or a long weekend, at college this summer. This costs the unions from $200 to $250 per man, since the unions not only pay traveling expenses, tuition, board and lodging, but also wages lost in the time spent away from work. Passage of the Labor Extension Service bill would not relieve the unions of these expenses—but it would give them the benefit of better educational facilities.

Incidentally, of the 10,000 to take summer courses this year, some 2000 will be from United Steelworkers—CIO unions.

The Labor Extension Service bill already is on the Senate calendar, while in the House the Labor and Education Committee is to hold hearings on it shortly.

Assures Payment for Exports

DOLLAR payments for exports to western hemisphere countries would be guaranteed under S. J. Res. 93, introduced by Senators Maybank, Murray, Pepper and Tobey. The Export-Import Bank Act of 1945 would be amended for this purpose.

The guaranty would extend to "small business." Senate Committee on Banking and Currency is expected to hold hearings on the measure. The measure does not have administration support in its present form, since the administration hopes that by arranging exchange stability with other powers, getting guarantees that our foreign investments will not be expropriated without fair compensation, and by setting up a mutual insurance system under which exporters and investors would protect themselves against abnormal losses in their foreign ventures, it will be able to create a climate within which foreign business can be conducted successfully.

ATOMIC COMMISSIONER: Gordon Dean becomes the newest member of the Atomic Energy Commission. His term runs to June 30, 1950

Export Requirements Changed

TWO CHANGES in provisions relating to export license applications for certain metal products have been announced by the Commerce Department's Office of International Trade.

Effective June 10, it will not be necessary to submit special certification that an order has been placed by a foreign buyer after a certain date, or reconfirmation of a previous order after that date, when applying for licenses covering shipments of barbed wire, concrete reinforcing bars, wire rods, uncoated and galvanized wire, and woven wire fencing. Exporters must continue, however, to submit the usual certification that they have firm orders for the products from foreign purchasers.

In another action, OIT provides a ten-day extension of the period for filing license applications covering third-quarter shipments of aluminum sheet, plate and strip. Deadline for filing is now June 20.

Aids Export of Scrap

PURPOSE of the recently established Office of International Trade policy of setting a quota on ferrous scrap exports is to facilitate shipments of scrap to certain consuming plants in Mexico and Chile which historically have been using scrap from the United States.

Under the new quota system, licenses can be granted without red tape for up to 40,000 tons a quarter; licenses already have been granted for this quantity of scrap to be shipped in second quarter, with applications for a similar quantity for third quarter yet to be acted on. Previously these licenses could be granted only after consideration by an interdepartmental committee which looked at them individually.

The new quota setup, incidentally, does not change the status of ferrous scrap for Canada. The "gentlemen's agreement" under which Canada undertook to limit its imports of ferrous scrap from the United States during our period of scarcity expired early this year and there now is no limit whatever on scrap shipments to Canada.

Europe's Capital Expansion

Viewed with mixed reactions as markets dwindle; Truman Point Four plan favored

PRESIDENT Truman's Point Four Program to improve undeveloped areas is having a moderately favorable reaction among European nations with colonies. Misgivings are aroused mainly because business in Europe is beginning to level off, and mother countries are increasingly dependent upon nonindustrialized areas for markets, particularly because capital expansion progresses and industrial production rises in the Old World.

Europeans recognize, however, that today only Americans are in the position to invest about $2 billion yearly abroad in the 1950s, a sum estimated by the National Association of Manufacturers as necessary to implement the Truman program. Europe knows that in the long run colonial development opens new markets, rather than closes old ones, but fear has been expressed that the program is an attempt merely to capture new customers for United States industry.

The question of markets looms very large now. Capital expansions proceed all over Europe, with the latest announced for Yugoslavia, Italy and Greece. Belgian, Luxemburgian and French industrialists are apprehensive lest their higher outputs prove Trojan Horses to imperil their economies.

BOILER IN FRANCE: A boiler, purchased by France through Marshall Plan assistance, stands on a dock at Le Havre. It is destined for a power plant at near-by Harnes. Hydroelectric plants are receiving top attention among France's basic industries

Western Germany

YUGOSLAV government has placed a $5.5 million order with F. J. Collin Ltd., Dortmund, to build the first coke oven battery in Yugoslavia. The plant will be erected at Kreka in Bosnia on the site of a large coal mine. Later a steel facility will be constructed on the same site. The coke plant will consist of two batteries, each with 75 ovens.

Total capacity will exceed 200,000 tons annually of high grade coke. The ovens will be charged with two-thirds bituminous coal and one-third brown coal. The contract includes construction of by-product plants for making ammonia, benzene and sulphur, the latter product by a process developed by Collin. The Dortmund firm is subcontracting much of the work, all but the refractories materials order going to other West German companies. A contract for a coal washing facility in Yugoslavia is also being negotiated.

West German steel production continues to hold at about 750,000 tons a month, a satisfactory output. Steelmakers generally are using a 28 per cent scrap and 72 per cent pig iron charge. Monthly scrap consumption of the steel industry amounts to around 200,000 tons. The raw materials situation, except for lime and manganese, is the easiest since the war, although coal may tighten if the Soviets throttle Polish exports. Polish coal is currently selling in large quantities at $8 per ton delivered, against an American coal price of $18-$20 per ton delivered in the Ruhr.

The German coal industry is planning and has already started limited construction of plants to process coal by-products.

The 50,000th Volkswagen has left the assembly line, and the company is now producing at the rate of 40,000 annually. About 60 per cent destroyed during the war, the Volkswagen plant is now more than half rebuilt. Delivery still takes a year on the car which carries a $1590 domestic price tag.

Belgium, Luxemburg

BELGIUM and Luxemburg are offering price concessions in the free markets where no commercial agreements are in force, as metalworking production climbs above the 1929 record.

Steel ingot and casting production in March totaled 729,273 net tons, an all time high. Machinery makers, engineering companies and shipbuilders are on a hand-to-mouth basis, and there is a diminishing demand for hardware, electrical goods and other domestic products.

Although large crowds visited the two industrial fairs in Brussels and Liege during May, more wanted to sell than to buy. The Liege exhibition featured machine tools, materials handling equipment and other capital apparatus. The Brussels fair concentrated more on end-product displays for consumers.

France

FRENCH steel ingot and casting production is expected to total 11,110,000 tons in 1949, the target set by the Monnet Plan and considered wildly optimistic when the plan was first presented. French rolled steel output nearly equaled in April and surpassed in March the 1929 monthly average of 598,000 tons.

The demand for steel in France remains high, but delivery dates are shortening. Dealers are discontinuing the practice of quoting steel export prices 20 per cent above home figures because of growing foreign competition.

Metalworking production is increasing. Auto output in March totaled 15,013 units, not a record but still high. Citroen and Renault, the largest producers, turned out more than half of the total, their joint output totaling 8995 vehicles.

Italy

USE of $4,932,000 of Marshall Plan funds to expand and improve two steam-electric power plants in Italy

has been authorized by Economic Cooperation Administration.

The projects to increase production of the two plants—one at Naples and one at Palermo, Sicily—will help alleviate an acute power shortage in Italy which is retarding industrial recovery. The Naples project, which calls for enlargement of the steam-electric plant there to increase capacity from 45,000 kw to 75,000 kw, will involve expenditure of $3,432,000 in ECA funds and 1 billion lire of the plant's own resources. Authorization for the Palermo project was $1.5 million to supplement a previous authorization of $4.8 million for this project which was made by ECA on Apr. 1.

This supplementary authorization was necessary for technical reasons to insure more economical operation of the plant which will be capable of generating 60,000 kw. Most of the equipment for the two projects will be purchased in the U. S.

A third steam-electric power project in Italy, a $6 million authorizatin for a 50,000 kw addition to a Genoa plant, was approved by ECA Apr. 1.

Greece

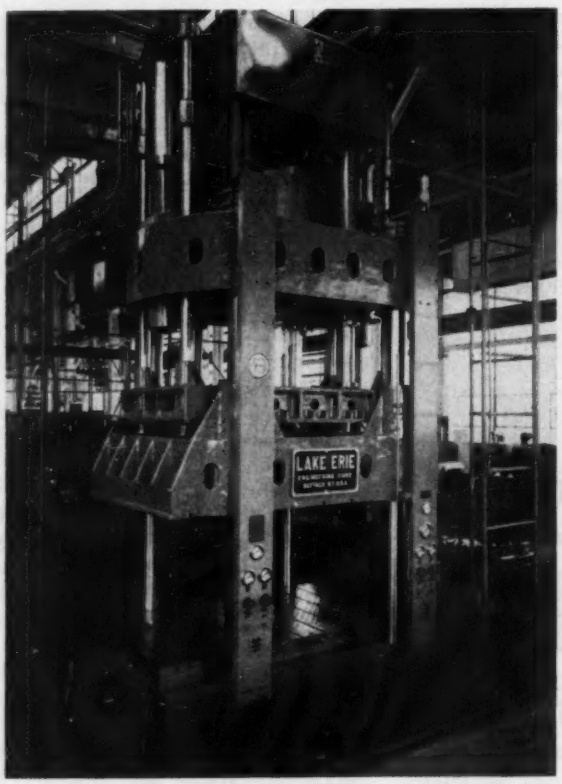
ECA HAS approved a $6 million project for improvements and additions to a Greek steam-electric plant operated by Athens Piraeus Electric Co. Ltd.

The project is designed to add 22,000 kw to the installed capacity of the plant which serves the Athens-Piraeus area where the greatest portion of Greek industry is located and where a critical shortage of electric power now exists. More than half the equipment will be purchased in the United States, the remainder in Great Britain. Equipment needed includes a steam turbine, diesel generating units, two high pressure boilers, two low pressure boilers and other apparatus.

Turkey

TURKEY is now a steel producer. In 1948 the state-owned works at Karabuk produced about 101,795 tons of pig iron, against 78,000 tons in 1947. Rolled steel output last year was 76,000 tons, against 56,500 tons in 1947. The country has two blast furnaces which have a capacity of 350,000 tons per year, but only one unit is now operating.

ECA has approved three recovery projects for the country involving an expenditure of $25.8 million. The projects are a highway rehabilitation program, development of coal fields at Conguldak and rehabilitation of the port of Xonguldak on the Black Sea.



BIG PRESS: This 1000-ton hydraulic press built by Lake Erie Engineering Corp., Buffalo, is shown before it was dismantled for shipment to an Italian automotive parts stamper. The equipment occupied three railroad cars

Of Worldwide Interest

High-top pressure blast furnaces of Republic Steel Corp. attract foreign visitors

HIGH-TOP pressure blast furnace blowing for which Republic Steel Corp., Cleveland, has become noteworthy is the source of much interest to visitors from foreign countries.

While the foreign visitors usually want to see some other Republic operation too, they invariably specify that they want to visit one of the company's furnaces using the high-top pressure method. Foreign visitors to these furnaces have included representatives from England, France, Belgium, Norway, Sweden, Holland and Australia.

Republic is using the high-top pressure system on five of its 21 blast furnaces and is installing it on two more. Present installations are at Cleveland, Youngstown and Warren, O., Buffalo and Chicago. The two additional installations are being made at Youngstown and are expected to be completed by the end of this year. When these are completed 42 per cent of Republic's blast furnace capacity will be high-top pressure equipped.

The high-top pressure method boosts pig iron production 10 to 15 per cent while cutting coke consumption. Essentially, this method restricts the escape of gases from the top of the furnace and at the same time blows more air into the bottom of the furnace. Net result is an increase in the volume of air blown into the furnace without increasing the velocity at which it passes through the furnace. This permits the coke to be burned more efficiently and prevents a large amount of flue dust from being blown out of the furnace.

As a result of addition of the high-top pressure equipment to Republic's one blast furnace at Warren the stack was expected to set a new production record of 1500 tons of iron daily in May. It formerly turned out 1200 to 1300 tons a day. Meanwhile, the furnace rate of coke consumption has declined to 1550 pounds per ton of iron produced, compared with 1700 to 1800 pounds previously.

Cobalt Plant Relocation Spurred

ONE result of rearming democratic nations, in the Atlantic Pact, under consideration by Congress, will be movement of some industries closer to sources of raw materials, the Canadian Congress of Mining pointed out recently. One evidence of

this was seen in the announcement negotiations are being completed for relocation of an English chemical plant at Cobalt, Ont.

The New Cross Chemical Co., Croyden, England, is reported preparing to open a plant at Cobalt, adjacent to the cobalt smelter and mines of Silanco Mining & Refining Co., for production of salts, oxides, powders and other derivatives of cobalt.

F. I. Hibbert, managing director of the chemical company, said his firm's decision to operate in Canada was forced by acute shortage of cobalt in England. With the United States the largest user, it seemed provident to re-establish his company's plant directly at a dependable source of raw material.

Cobalt, Ontario, has the only major deposits of cobalt in North America. Most of the world's supply has come from Belgian Congo and Rhodesia.

Since World War I cobalt has become one of the world's most versatile metals. Its chemical derivatives are used to fertilize land, condition cattle, harden plate glass and provide the hardness and gloss to varnishes; it is also used as a paint pigment and drier. Because of its magnetic qualities it is found in every telephone, and is used in many electronic devices.

The Silanco company's smelter, is said to be the largest of its kind in the Western Hemisphere with capacity for treating ten tons of concentrates per day. The New Cross Chemical Co. will build its new plant adjacent to the smelter with which some of its processes will be interrelated.

Push Oil and Gas Developments

RAPID expansion of oil and gas development in the Rocky Mountain area is beginning to increase steel demand, and continued prospecting for new petroleum fields forecasts continued buying of steel pipe, structurals, tanks and other steel products.

The latest development in this trend is announcement by Mountain Fuel Supply Co. of its intention to build a 20-in. natural gas line from Coalville, Utah, to Salt Lake City. Work on the line will begin in July and completion is expected next fall. The line will cost about $1,750,000.

This follows closely an announcement by Standard Oil Co. of California it will build a $10 million catalytic cracking gasoline refinery at Salt Lake City to process crude oil from the Rangely field in Colorado. Installation of new tankage will begin within a few weeks, and work on the refinery itself will get underway in a few months. Completion is scheduled by the end of 1950.

As the search for new gas and oil fields bears fruit, it is believed other refineries will be constructed in the mountain region, and new pipelines will be laid in both directions, east and west. More than 142 oil and gas fields have already been located and proved in Colorado, Utah, Wyoming, Montana and parts of New Mexico. The prospecting now is spreading westward and oil companies are actively signing new leases in Nevada.

Coast Shipbuilding Nearly Down

HIGH costs and depressed state of Pacific shipping are chief factors curtailing shipbuilding operations on the West Coast, according to Daniel D. Strohmeier, vice president in charge of shipbuilding, Bethlehem Steel Co.

During the war, ship construction boomed on the West Coast, but since the war ended it has become the area's most depressed metalworking industry. Excepting repair work, activity in most coast yards is nearly dormant.

Mr. Strohmeier believes one remedy is to build up Pacific shipping.

Cost Problem—The problem of costs is equally difficult. Wage scales on the West Coast are substantially greater than in East Coast yards, and the West Coast's distance from adequate sources of materials is another drawback.

As an illustration of how these factors militate against shipbuilding in western yards, Mr. Strohmeier cited the case of 32 tankers which Bethlehem is building at its yards at Quincy, Mass., and Sparrows Point, Md.

"These ships," he said, "were not allocated by the government, but were purely private jobs. When the private owner shops around for tankers he looks for design, price and delivery time. That is all the shipbuilder has to sell. Price is the most important and the yard that gets the job is that which can do it cheapest.

No Subsidy—"On these tankers there was no government subsidy to offset the high cost of building ships on the West Coast. Our company is working hard to keep its West Coast yards busy and we had hoped some of the tankers might be built in San Francisco. But a complication arose. The dimensions of the tankers are such that the San Francisco ways could not handle them."

Mr. Strohmeier describes the current position of the U. S. shipbuilding industry as "black," and said the only bright spot was the current tanker program.

CALENDAR OF MEETINGS

June 6-8, American Gear Manufacturers Association: 33rd annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Empire Bldg., Pittsburgh.

June 8-9, American Management Association: National conference on key management issues, at the Waldorf-Astoria Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

June 9-10, American Coal Sales Association: Annual convention, the Greenbrier, White Sulphur Springs, W. Va. Association headquarters are in the Washington Bldg., Washington, D. C.

June 9-10, Steel Founder's Society of America: Industrial relations meeting, Drake Hotel, Chicago. Society headquarters are in the Midland Bldg., Cleveland.

June 13-14, Stoker Manufacturers' Association: Annual meeting, French Lick Springs, Ind. Association headquarters are at 307 N. Michigan Ave., Chicago.

June 13-15, Material Handling Institute: Great Lakes materials handling conference, Doermann Theater, University of Toledo, Toledo, O. Institute headquarters are at 1108 Clark Bldg., Pittsburgh.

June 13-15, American Society of Mechanical Engineers: 15th national applied mechanics conference, Ann Arbor, Mich. Society headquarters are at 29 W. 39th St., New York.

June 16-17, Malleable Founders' Society: Annual meeting, The Homestead, Hot Springs, Va. Society headquarters are at 1800 Union Commerce Bldg., Cleveland.

June 20-22, National Association of Purchasing Agents: 34th convention and show, Hotel Stevens, Chicago. Association headquarters are at 11 Park Place, New York.

June 20-23, American Society of Agricultural Engineers: Annual meeting, East Lansing, Mich. Society address is Box 229, St. Joseph, Mich.

June 20-24, American Standards Association: Seminar on standardization at association headquarters, 29 W. 39th St., New York.

June 20-24, American Society for Engineering Education: Annual meeting, Rensselaer Polytechnic Institute, Troy, N. Y.

June 24, Porcelain Enamel Institute: Third annual sales management conference, Carter Hotel, Cleveland.

June 27-28, American Foundrymen's Society: Chapter chairmen's conference, Chicago. Society headquarters are at 222 W. Adams St., Chicago.

June 27-30, American Electroplaters' Society: National convention, Hotel Schroeder, Milwaukee. Society headquarters are at 473 York Rd., Jenkintown, Pa.

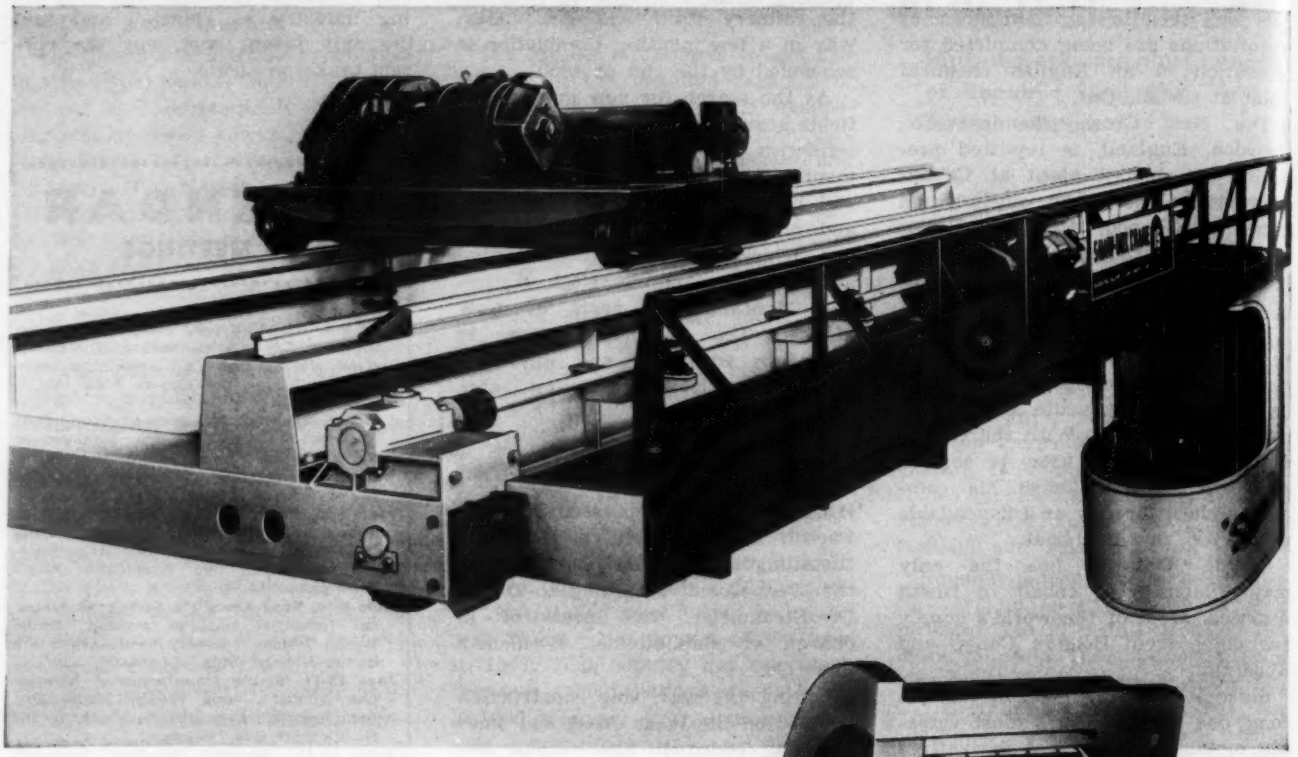
June 27-July 1, American Society of Mechanical Engineers: Semiannual meeting, University of California Extension Bldg., San Francisco. Society headquarters are at 29 W. 39th St., New York.

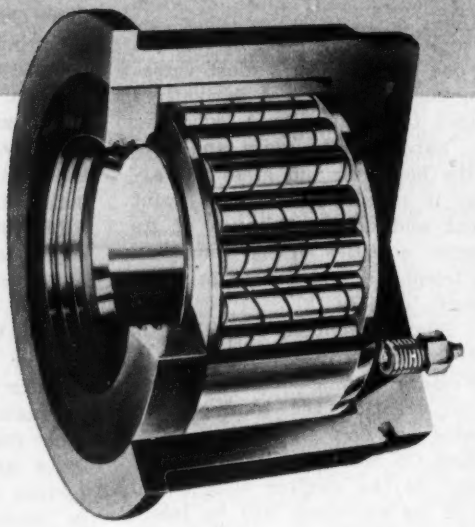
July 13-15, American Society of Civil Engineers: Summer convention, Mexico City. Society headquarters are at 33 W. 39th St., New York.

July 14-15, Magnesium Association: Quarterly meeting, Hotel General Brock, Niagara Falls, Canada. Association headquarters are at 30 Rockefeller Plaza, New York.

July 22, Truck-Trailer Manufacturers Association: Mid-year general meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 809 National Press Bldg., Washington.

July 28-29, American Foundrymen's Society: Annual directors' meeting, Chicago. Society headquarters are at 222 W. Adams St., Chicago.





Features of this "*Plus Value*" Crane include HYATTS

Manning, Maxwell & Moore has made available to industry a new heavy duty overhead electric traveling crane.

They call it the Shaw-Box Type "SB" "Plus Value" crane because of several important features, not the least of which are the Hyatt Roller Bearings at all vital bearing points. Fitting Hyatt Bearings in a cartridge, as shown above, eliminates distortion of the bearing races and keeps the grease in and dirt out.

Experience has taught that the application of Hyatt Roller Bearings is one way of insuring "plus value" in the equipment you build, buy or sell. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Ford strike ends after three-week stalemate in negotiations but production and wages losses can never be made up. New contract talks may be tough

DETROIT

ON FRIDAY before the Memorial Day weekend, suppliers began receiving instructions to resume certain shipments to the strikebound Ford plants in care of specified railroad freight depots, which was the tipoff that a break in the three-week stalemate in negotiations between the union and company management was imminent.

It came the following day and the UAW called for ratification of the settlement by a secret ballot of the membership on Sunday. About five per cent of the Rouge plant employees voted, and 10 per cent of the Lincoln-Mercury plant force, both approving the agreement by a substantial majority.

Notices immediately went out to employees to start reporting back to work, with 20,000 returning on Tuesday and the balance of the 65,000 Detroit-area personnel on succeeding days. It may be another week before all branch plants have picked up operations again.

Everyone Lost—Who won? As in all strikes, nobody. Everyone lost. Employees lost a minimum of 16½ days' wages, most of them more. The company lost production of an estimated 100,000 cars and trucks, worth perhaps $110 million. Suppliers lost the equivalent of better than $70 million in Ford purchases. Steel production at the Rouge plant suffered to the extent of something like 100,000 tons. Dealers handling Ford-Lincoln-Mercury products saw untold thousands of customers buy competitors' merchandise.

The sad part is that all these things can never be made up, they are gone for good. Naturally the UAW leaders had to claim they won something, so they pointed to the company's agreement to arbitrate this sole question . . . does the company, under the contract, on the basis of health and safety of the employees or otherwise, have the right to require an employee to perform his work assignment on any unit in less time than the company's time study shows for his assignment, provided the employee is not assigned more than 480 minutes of work as measured by time study in an 8-hour shift? It will be answered either by a single arbitrator or an arbitration panel, and they in turn select a third, or try to. If this is not successful, then the third party will be Dr. Harry Shulman, impartial umpire under the present contract. Decision of the panel is by majority vote, or obviously 2 to 1.

Had Offered to Arbitrate — The Ford management offered to arbitrate the issue even before the strike was called, but the UAW refused, saying the question was not one which could be arbitrated. Then the union demand that new contract talks be sandwiched with negotiations over the strike and the company flatly rejected this scheme. Just as union leaders were threatening to break off all talks, a federal conciliator appeared on the scene and managed to keep the discussions going. Finally, the union group must have realized their case was hopeless, so approval was given to arbitration after long hours of haranguing over the wording of the question.

Six other minor issues were resolved in the settlement. 1. Management agreed to maintain assembly lines at a constant speed to achieve daily production schedules and to space cars uniformly along the line to provide an even flow of work past assembly stations. On request, the company will notify the union of expected daily schedules and the necessary line speeds. 2. When mixing of different body types on a line results in additional work, the company will make adjustments where necessary by adding manpower, reducing units on the line, reducing speed of the line, or stopping it momentarily. 3. Relief men will be designated in the ratio of one for each 19 production employees. 4. The normal amount of work required of employees will not be increased because of absenteeism. 5. The company will undertake a review of certain assembly line jobs which the union claims are "tight" and if necessary make adjustments. 6. Penalties imposed on 35 employees for actions before and during the strike will be moderated and dismissals changed to reprimands.

Returning Employees Glum—Most of the returning employees were inclined to be glum, feeling that the strike had lasted too long for what had been accomplished. However, they were resigned to follow what their leaders told them to do and few showed any marked resentment against their officials. The strike was completely orderly throughout, and this even drew commendation from Ford's industrial relations vice president, John S. Bugas, who was head of the company negotiating team. Other officials joined him at times, including Del S. Harder, head of the Ford division manufacturing, and William T. Gossett, legal counsel. At no time did either Henry Ford II or E. R. Breech, executive vice president, take part in the discussions.

Next on the negotiating agenda are talks on a new contract which started last Thursday. They are likely to be plenty tough, since the company, after taking nearly a month's loss of production squarely on the chin, cannot be expected to be in a generous mood over such proposals as pension plans, wage increases,

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	505,000*	359,996
June		454,401
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

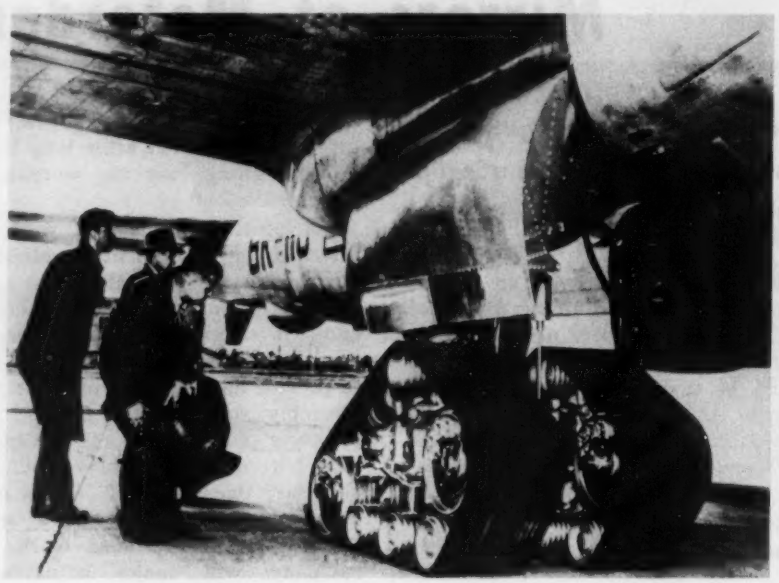
* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
May 14	119,634	83,275
May 21	116,878	91,138
May 28	115,001	92,772
June 4	92,000	75,607

Estimated by Ward's Automotive Reports

(Material in this department is protected by copyright and its use in any form without permission is prohibited)



FOR TOUGH ASSIGNMENTS: Undergoing tests on a Boeing B-50 Superfortress is this tractor-tread type landing gear designed to make it possible for medium or heavy bombers to operate from unimproved airfields. The two main landing gears are equipped with double treads and the nose wheel with a single one and allow the plane to roll over small obstructions with ease. All gears retract completely in flight and do not affect the plane's top speed. NEA photo

hospitalization or any of the other things the union is going to propose. For its part, the union will be strictly on the defensive since it has already just about exhausted the potency of a strike threat to enforce its demands. A second walkout, should an impasse develop in contract talks, seems the remotest of possibilities. A three-cent hourly wage boost, to match the General Motors "annual improvement factor," applied to wage rates, might be a logical eventuality, although Ford probably would agree to this only after the most strenuous objections.

New Ford Styling Consultant

IN a surprise move, Ford has reacquired the services of George W. Walker, industrial designer who was consultant in the design of the 1949 model and whose two-year contract was not renewed last July. He will act as consultant on styling of all Ford products, including Lincoln, Mercury and commercial units, and will work in collaboration with John Oswald, executive engineer in charge of styling and body engineering, and George Snyder, chief stylist.

Walker's creative work in the automotive industry dates back 20 years to when he first arrived in Detroit to open a studio. He has done everything from refrigerators to fountain pens and for a time worked with Nash and Packard on new body styling. The fact Ford won the fashion academy award as a style leader recently may have convinced the management team it would be worthwhile to get Walker back and turn him loose on Mercury and Lincoln, even though there were some minor differences of opinion in its own ranks. A year ago, Walker was well along with dozens of new style ideas, both for the elaborate renderings and quarter-size models for Ford. They can probably still be salvaged.

It is not likely Ford will have anything entirely new until next summer, as it was the original plan to spread out the heavy tooling cost of the present model over two years. The loss of time occasioned by the strike set back activity in the company's Tool & Die Division, but it is believed there were no major programs under way there and the 1950 or 1951 model is still in the styling and engineering phase. This is probably one reason Walker was called back at this time.

GM's Technical Center Starts

CONSTRUCTION contract for the first buildings in the General Motors technical center finally has been awarded to Bryant & Detwiler Co., Detroit, with the timetable for completion extending over the next three years. In two weeks, ground will be broken for the engineering group, including administration and drafting, shop and dynamometer buildings, extending over 235,000 square feet of space. Next will come the Research Laboratories Division group—427,000 square feet of office, laboratory and shop space and including metallurgical, laboratory, mechanical and processing buildings. Initial buildings for the engineering group will be ready for occupancy by early summer next year.

Plans for the center were announced first July 24, 1945, but work on the project was deferred because of materials shortages and high costs. Buildings will be on a 350-acre site, grouped around a seven-acre artificial lake. Exterior walls of office buildings, in general, will be of thermopane or transparent glass units, separated by dehydrated captive air and sealed around the edges by a metal-to-glass bond. The entire project will embrace the vast research, engineering staff, processing and styling operations of the corporation, although it will in no way change the concept of divisional responsibility, being purely a research, technical fact finding and experimental development activity.

Studebaker Gets More Power

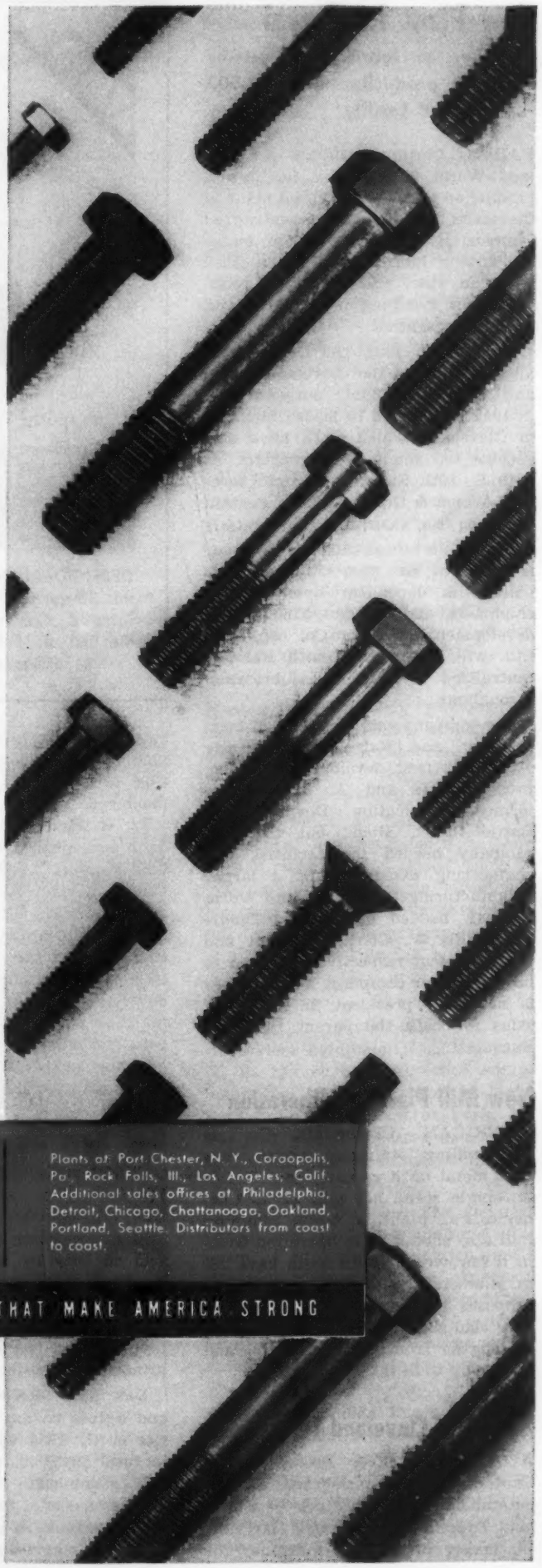
TO MEET steadily higher production demands on electric power, steam and compressed air, Studebaker has increased its power plant capacity at South Bend, Ind., through installation of a $500,000 boiler rated at 210,000 pounds per hour. Similar to two others previously installed, it is fired by a spreader stoker equipped with moving grates which discharge ash continuously at the front of the unit. The stoker has six coal feeding elements and is divided into the separate sections which can be operated individually for handling low power loads and for cleaning or inspection.

Expects Auto Output To Slip

THE LATTER part of this year will see a lowering of existing production levels on the part of all automobile manufacturers, in the opinion of Alfred P. Sloan Jr., General Motors board chairman, in an address to stockholders at the May 20 annual meeting.

He cited two principal reasons for the expected decline—because automotive products then should be in ample supply, and the seasonal trend, inoperative since the war, will in all likelihood manifest itself in a reduction in sales to consumers.

Fastener appearance that contributes to the sales appeal of the final product—helps you get *True Fastener Economy*. The exceptionally fine finish of RB&W Cap Screws and Square Head Cup Point Set Screws is the product of more than a century of continuous research and progressive development in fastener manufacturing . . . backed by the skill of four generations of RB&W men and women.



R B & W

THE COMPLETE QUALITY LINE

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

New Plant for Farval

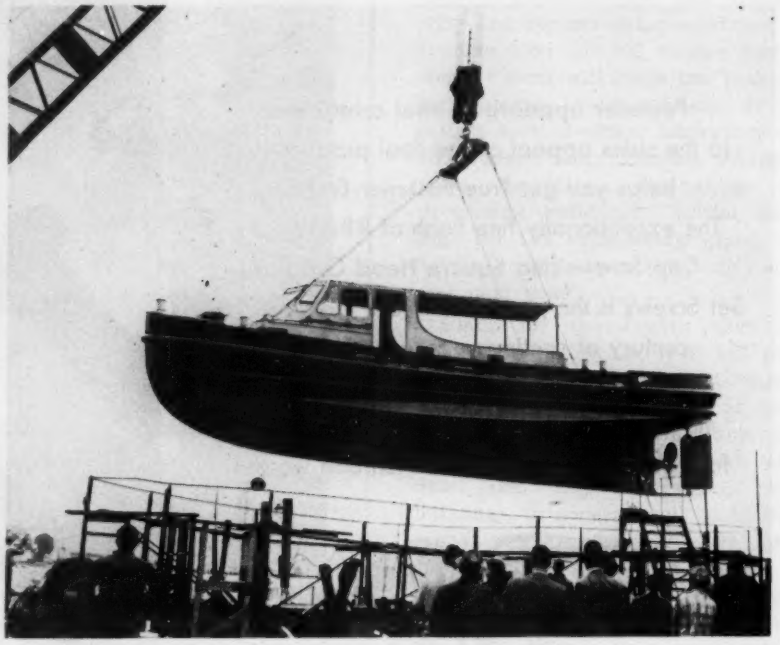
Maker of lubricating systems begins production in $300,000 Cleveland facility

FARVAL Corp., an affiliate of Cleveland Worm & Gear Co., has begun production at a new $300,000 plant in Cleveland. The firm makes centralized systems of lubrication which meter the flow of lubricants to complicated gears in steel mills, machine tools, materials handling equipment and related apparatus.

Founded in 1932, the firm originally operated at the Cleveland Worm and Gear Co. plant, outgrew this in 1946 and moved to leased facilities in Cleveland, which since have also become too small. New quarters, at 3249 E. 80th St. across from Cleveland Worm & Gear's factory, contain 18,000 sq ft of floor area.

Farval's business thus far this year is ahead of last year's. Some of its volume is dependent upon foreign shipments, and the new $160 million development of Steel Co. of Wales Ltd. will be installed with Farval's centralized system of lubrication throughout.

The company name was coined from "Farmer" and "Valve." A. J. Farmer of Detroit first developed the valve product. He and A. J. Jennings formed Lubrication Devices Inc., Battle Creek, Mich., but the new company needed the facilities and engineering experience of a larger manufacturing firm. Cleveland Worm & Gear, headed by Howard Dingle and Willis W. Clark, president and vice president respectively, proved to be that larger company. Mr. Jennings is now vice president in charge of sales for both the parent firm and Farval.



DERRICK LAUNCHING: Instead of the marine railway style of launching, this 30-ton tow boat was hoisted by derrick out of its cradle at Churchward & Co. Inc.'s West Haven, Conn., yard. This 50-foot craft is the first of 19 to be built and delivered to Creole Petroleum Corp. for its offshore oil well operation in Lake Maracaibo, Venezuela

New Mill Placed in Operation

AMERICAN Cladmetals Co. is now rolling stainless copper core clad metal on a recently installed 6-in. single stand hot mill at its Carnegie, Pa., plant. A 60-in. roughing mill also should be in operation within a few weeks. Both units have 28-in. diameter work rolls. Company proposes to furnish stainless copper core clad sheets within 10 to 24 gage in lengths from 6 to 13 ft. and widths up to 54 in.

Purchases Cleveland Tapping Co.

AUTOMATIC Steel Products Inc., Canton, O., has purchased all the outstanding common stock of Cleveland Tapping Machine Co., Hartville, O., maker of tapping machines for cutting screw threads. Expansion is planned in development and production of automatic multiple tapping machines.

W. R. Harrison remains as president and general manager of Cleveland Tapping. A. M. Wickwire, president of Automatic, becomes vice president of the other firm.

Other activities of Automatic include manufacture, assembly and sale of mercury-actuated clutches for industrial uses, spun steel pulleys used in the automotive field, abrasive grinding wheels for bench and tool grinding and valve seat grinding and automotive jacks.

Dow Buys Magnesium Plant

GOVERNMENT magnesium plant at Freeport, Tex., which Dow Chemical Co. operated jointly with its own plant during the war, has been sold to Dow by the Federal Works Agency to assure continued production of this metal. Dow's private plant is adjacent to the government's property and is the only producer of primary magnesium in the U. S.

Dow paid $608,000 for the facility and agrees to pay production royalties untily 1953 which are estimated to total $625,000. The company also will rehabilitate the plant at an estimated cost of $212,000. Agreement further stipulates that Dow will have available magnesium at the rate of 20 million pounds per year until 1953 for sale to the government.

Granite City Builds Open Hearth

RUST Furnace Co., Pittsburgh, has been awarded a contract for a new open-hearth furnace and auxiliary installations to be constructed for Granite City Steel Co., Granite City, Ill. Preliminary construction work on the $1.5 million project has started.

The new open hearth will have a capacity of 185 tons per heat. It will be the fourth furnace in Granite City's new shop which was built during the war. Steel company officials state that the new furnace will provide an additional annual ingot capacity of from 100,000 to 120,000 tons, to be used for carbon steel ingots.

Demonstrates Roof Fastening

NELSON Stud Welding Corp., Lorain, O., last week at Cleveland held the first of a series of demonstrations for architects, engineers and contractors of its method of fastening corrugated sheet metal roofing and siding through use of a special welding gun which end-welds rivets to the steel purlins. The corrugated metal then is impaled over the rivets, which are upset and rounded off. Other demonstrations will be held throughout the country.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Carrier Corp., Syracuse, N. Y., has appointed Refrigeration Sales Corp., Cleveland, as distributor for Carrier self-contained air conditioning units in the Cleveland area.

—o—

Reynolds Metals Co., Louisville, Ky., has released "The Tale of the Powdered Pig," a new sound and color film describing the uses to which aluminum powders and pastes are put.

—o—

Massey-Harris Co., Racine, Wis., maker of farm equipment, is opening two branch offices at Memphis, Tenn., and Atlanta.

—o—

Northrop Aircraft Inc., Hawthorne, Calif., has begun occupying a new warehouse being constructed in Lynwood, Calif. The facility will be used for handling aircraft materials.

—o—

Markal Co., maker of Paintstiks for marking hot and cold castings, has moved to new quarters at 3052 W. Carroll Ave., Chicago.

—o—

J. R. Brockman Mfg. Co., producer of pipe bends, coils and headers, has changed its name to J. R. Brockman Co. Inc. and has moved to 812 N. First St., St. Louis.

—o—

Nichols Wire & Aluminum Co., Davenport, Iowa, manufacturer of aluminum building products, has become a member of the Producers' Council, a group composed of building products manufacturers.

—o—

Torrington Co., Torrington, Conn., and South Bend, Ind., has appointed Binkleman Bearings Inc., Toledo, and W. P. Cunningham Co. and P. L. Walker Co., both of Houston, as distributors for Torrington bearings.

—o—

Blaw-Knox Co. will spend $1.5 million in modernizing foundry plants of its Lewis Foundry & Machine Division, Union Steel Castings Division and Pittsburgh Rolls Division, all in the Pittsburgh area.

—o—

Fort Pitt Bridge Works, Canonsburg, Pa., was host to more than 4000 at an open house May 20, in a joint celebration of Pittsburgh's Welcome Week activities and the company's 53rd anniversary.

—o—

Hooker-Detrex Inc., Niagara Falls, N. Y., will build a $1.5 million plant in Ashtabula, O., to help meet the demand for trichlorethylene as a metal cleaning and oil extraction solvent.

—o—

Katy Park Industrial Development Corp., Houston, is continuing plans to build a multimillion dollar industrial building project which will occupy the 23-acre site of the Missouri-Kansas-Texas Railroad's present terminal facilities in downtown Houston.

—o—

Ward Leonard Electric Co., Mount Vernon, N. Y., producer of electric controls, has appointed Central Station Engineering Co., Tucson, Ariz., as sales representative in Arizona.

—o—

Air Reduction Co., New York, manufacturer of industrial gases and welding equipment, has established a new warehouse point in Tulsa, Okla., which will be located with Fidelity Transfer & Storage Co., 1540 E. Fifth St., and will carry supplies of oxygen and acetylene gas.

—o—

W. E. Moore Co. and its associated companies, Pittsburgh Lectromelt Furnace Corp., Pittsburgh Lectrodryer Corp. and West Penn Machine Shops, has purchased land and buildings formerly occupied by Duquesne Smelting Corp. in Pittsburgh.

DISTRICT MANAGER: Philip E. Whiting, named Eastern district manager of Automatic Transportation Co., Chicago, will head the materials handling equipment manufacturer's newly established factory branch sales office and parts and service depot in New York. Sales headquarters, which will include Automatic's New York export office, is at 347 Madison Ave.

—o—

Cutler-Hammer Inc., Milwaukee, manufacturer of motor controls, has moved its Boston district sales office to 784 Commonwealth Ave. C. V. Topliffe heads the office.

—o—

National Lead Co., New York, reports its Atlantic branch export department in New York, formerly consisting of metal and pigment divisions, has been consolidated into one unit, in charge of Michael Howard. National Lead has also established a new mining department headed by Gloyd M. Wiles who is manager of the company's St. Louis Smelting & Refining Division.

—o—

Timken Roller Bearing Co., Canton, O., will inaugurate its 50th anniversary celebration with an open house June 20-24 in its plants at Canton, Columbus, Zanesville, O., Colorado Springs, Colo., and St. Thomas, Ont., Canada.

—o—

Meaker Co., Chicago, producer of electroplating machines and galvanizing equipment, is observing its 50th anniversary.

—o—

Eastern Sales & Engineering Co., Baltimore, has established a temporary plant at 2650 Bruce Alley, to manufacture street signs, street and highway lighting standards and related products. A permanent plant will be erected this fall adjacent to its present facility at 423 St. Paul St., Baltimore.

—o—

Cole Steel Equipment Co., Brooklyn, N. Y., maker of steel office equipment, has bought the former York Safe & Lock Co. plant at York, Pa. The unit will be operated in addition to the company's Brooklyn facility.

—o—

International Business Machines Corp., New York, is planning a program of expanded production in its European factories. The expansion will be financed chiefly with company funds that have been frozen in those countries because of exchange restrictions.

—o—

Society of Carbide Engineers, West Hartford, Conn., will award a prize of $50 to the person submitting the most outstanding article pertaining to the use of cemented tungsten carbides. Contest is open until Oct. 15, 1949.

The Business Trend

TEMPO of business activity continued its gradual slowdown in the week ended May 28 as STEEL's industrial production index fell off another point and and reached a preliminary 166 per cent of the 1936-1939 average. This marked the fifth consecutive week in which the index was below the previous week level and also narrowed the gap between the index for the latest week and the one for the corresponding week a year ago to only 2 points, the smallest margin since the first week of this year.

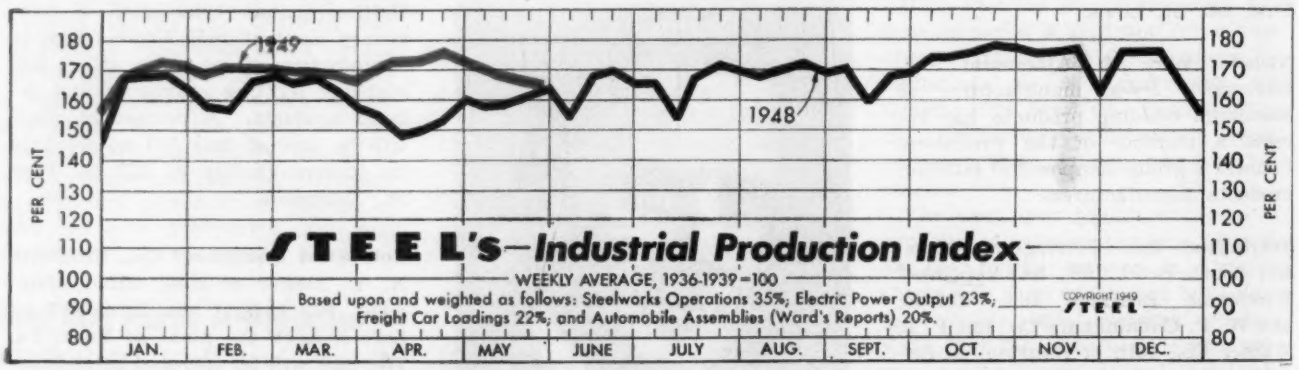
PRODUCTION—Federal Reserve Board's seasonally adjusted industrial production index for April also showed the slackened pace of nation's industrial activity. April's index was at 179 per cent of the 1935-1939 average, lowest point since July, 1947, and was the fifth consecutive month in which the index has declined since the postwar high of 195 was reached in November, 1948. The board reports that steelworks operations in April showed a drop of 3 per cent in open-hearth production and 23 per cent in electric furnace output.

AUTOMOBILES—Outturn of passenger cars and trucks showed its fifth consecutive decline in the week ended May 28 with 115,001 units rolling off assembly lines as compared with 116,878 in the preceding week. An estimated 1,956,812 passenger cars and 563,130 trucks were built in U. S. and Canadian plants during the first five months of 1949 with another 68,000 units lost because of the Ford strike.

BUSINESS—As a result of the downtrend in business activity, new business incorporations in April were down 4.8 per cent from the preceding month and 21.1 per cent below the corresponding month last year. During April a total of 7273 new firms were chartered, according to Dun & Bradstreet Inc. Company formations during the first four months of this year totaled 29,178 which is a drop of 22.1 per cent below the number formed in like 1948 period.

SALES—Department of Commerce reports that manufacturers' sales declined more than seasonally in April. Total value of sales was $16.9 billion, $1.2 billion below the March aggregate. Half of the decrease was attributable to the shorter work month and other seasonal factors. Because of the downward movement of wholesale prices in April, however, the decrease in physical volume was not so large as the change in dollar figures. In the face of decreasing sales, manufacturers' inventories were reduced by $400 million, resulting in a total of $31.4 billion at the month's end. On a seasonally adjusted basis this decline was equal to $300 million, equally divided between the durable and nondurable groups.

PRICES—Wholesale price index of the Bureau of Labor Statistics advanced 0.3 per cent to 156.5 per cent of the 1926 average in the week ended May 24 due to gains by farm products and foods. Excluding the two aforementioned categories, all other commodities declined 0.4 per cent. Metals and metal products index continued its descent during the week to 167.5 per cent of the 1926 average.



Index (chart above): Week ended May 28 (preliminary) 166 Previous Week 167 Month Ago 174 Year Ago 164

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	94.5	95.0	98.0	96.0
Electric Power Distributed (million kilowatt hours)	5,270	5,255	5,304	5,076
Bituminous Coal Production (daily av.—1000 tons)	1,855	1,842	1,892	2,452
Petroleum Production (daily av.—1000 bbl)	4,900‡	4,904	4,922	5,452
Construction Volume (ENR—Unit $1,000,000)	$193.7	$157.8	$145.9	$189.9
Automobile and Truck Output (Ward's—number units)	115,001	116,878	136,433	92,772

* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons. ‡ Preliminary.

TRADE				
Freight Car loadings (unit—1000 cars)	767†	774	785	905
Business Failures (Dun & Bradstreet, number)	175†	172	204	112
Money in Circulation (in millions of dollars)‡	$27,367	$27,392	$27,356	$27,700
Department Store Sales (changes from like wk. a yr. ago)‡	−5%	−3%	−10%	+7%

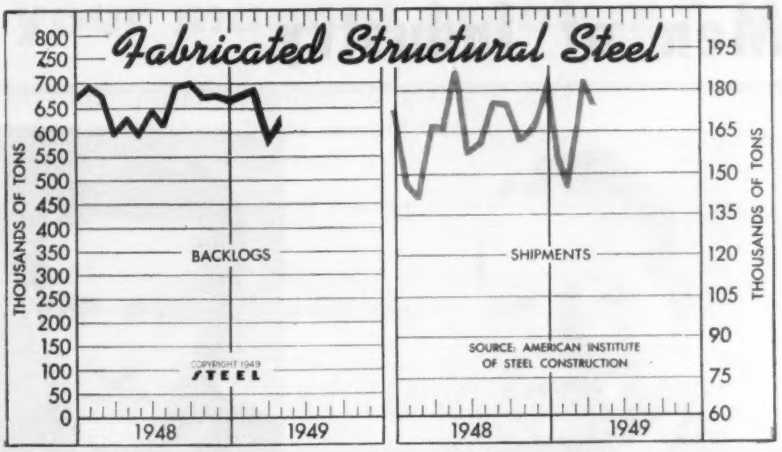
† Preliminary. ‡ Federal Reserve Board.

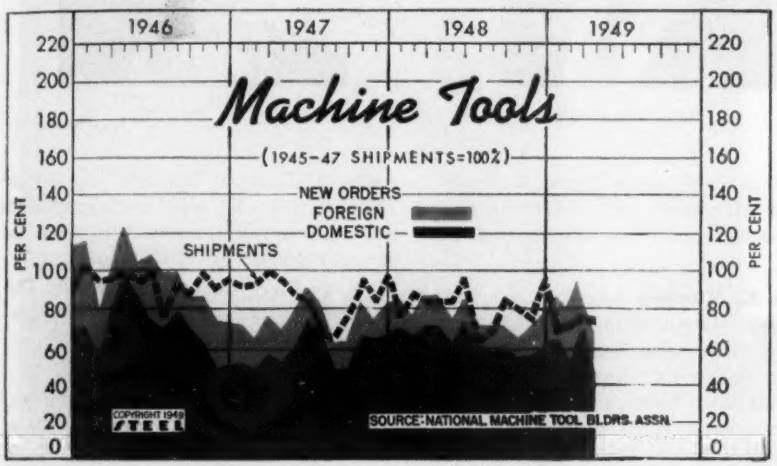
Fabricated Structural Steel

(000 Tons)

	Shipments			Backlogs		
	1949	1948	1947	1949	1948	1947
Jan.	152.7*	146.4	140.6	675	692	661
Feb.	145.9*	141.6	136.1	683	673	656
Mar.	185.9*	167.0	137.8	582	597	614
Apr.	174.1	166.7	157.4	628	630	632
May	....	186.9	155.0	...	593	628
June	....	157.1	151.9	...	647	634
July	....	160.8	169.9	...	613	661
Aug.	....	176.3	158.0	...	691	639
Sept.	....	175.0	164.3	...	698	648
Oct.	....	164.0	196.1	...	669	649
Nov.	....	169.8	175.0	...	673	645
Dec.	....	182.4	173.0	...	670	671
Total	....	1,993.9	1,915.1			

* Revised.





Machine Tools

(1945-1947 Shipments = 100)

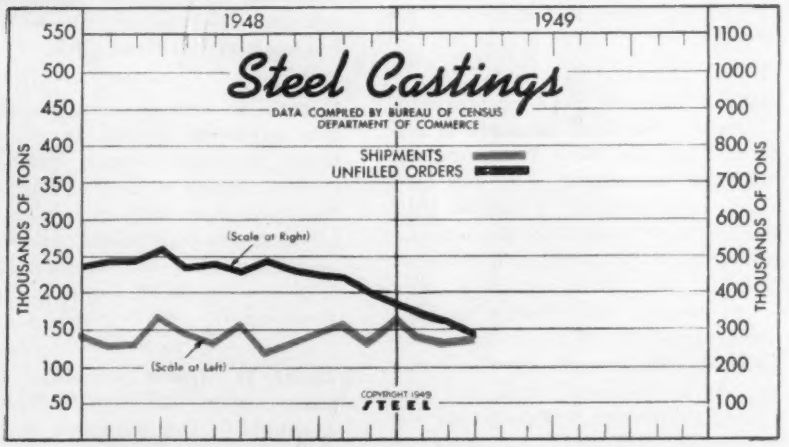
	Orders				Shipments	
	Total		Domestic			
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	69.8	86.3	47.0	72.2	74.4	82.0
May	73.5	...	62.1	...	...	82.6
June	83.4	...	71.5	...	...	94.4
July	74.0	...	61.1	...	...	62.4
Aug.	73.7	...	60.9	...	...	69.8
Sept.	73.1	...	61.5	...	...	84.7
Oct.	67.4	...	53.4	...	...	80.4
Nov.	72.2	...	54.1	...	...	76.2
Dec.	76.7	...	60.5	...	...	96.9

Steel Castings

(Net tons in thousands)

	Shipments			Unfilled Orders*		
	1949	1948	1947	1949	1948	1947
Jan.	140.6	141.1	139.0	338.9	491.7	365.5
Feb.	135.0	142.4	125.6	320.2	497.1	421.4
Mar.	138.9	162.9	134.9	284.8	508.8	434.9
Apr.		150.3	144.2	....	472.4	427.6
May		143.3	140.9	....	482.5	443.2
June		152.9	139.0	....	470.0	445.5
July		120.4	117.0	....	497.4	473.9
Aug.		140.2	120.4	....	472.5	478.6
Sept.		149.2	137.4	....	448.0	526.2
Oct.		153.0	148.4	....	424.5	497.3
Nov.		146.8	130.1	....	395.0	493.3
Dec.		157.4	148.1	....	354.5	489.4

* Castings for sale.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,729	$13,778	$12,685	$14,097
Federal Gross Debt (billions)	$251.7	$251.7	$251.4	$252.2
Bond Volume, NYSE (millions)	$13.9	$15.6	$15.1	$28.4
Stocks Sales, NYSE (thousands)	3,836	4,361	4,332	8,284
Loans and Investments (billions)†	$62.2	$62.0	$61.3	$63.5
United States Gov't. Obligations Held (millions)†	$33,872	$34,111	$32,765	$36,866

† Member banks, Federal Reserve System.

PRICES

STEEL's Composite Finished Steel Price Average	$92.77	$93.55	$94.45	$80.27
STEEL's Nonferrous Metal Composite‡	176.1	183.0	193.2	196.6
All Commodities†	156.5	156.0	156.1	164.5
Metals and Metal Products†	167.5	168.0	170.5	157.2

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

Men of Industry

J. W. KINNEAR JR.

ROBERT E. MARSHALL

E. E. ESGATE

J. W. Kinnear Jr. has been elected president, Firth Sterling Steel & Carbide Corp., McKeesport, Pa., succeeding **L. G. Firth,** who continues as a member of the board of directors and director of research and development. Mr. Firth has been president and general manager since 1933, when he succeeded his father, **Lewis Firth,** a founder in 1896 of Firth Sterling and first president. Mr. Kinnear has served as executive vice president for nearly two years, and a director for 15 years.

—o—

Philip C. Muccilli has been appointed assistant production manager of National Lead Co., New York, and will supervise the operation of the company's metal plants. **Frank R. Milliken** has been appointed an assistant manager of the company's Titanium Division, New York, and is succeeded by **George W. Wunder** as plant manager of the MacIntyre development at Tahawus, N. Y., where **Paul W. Allen** becomes assistant plant manager. **George A. Savage** has been appointed manager of the Metal Division, National Lead Co. of Massachusetts, Boston, and **Karl Fischer** was appointed manager of its Pigment Division.

—o—

Mead W. Batchelor has been promoted from vice president in charge of production to executive vice president, Bridgeport Brass Co., Bridgeport, Conn. He has been with the company since 1933, when he came from Revere Copper & Brass Inc. to join the engineering staff. In 1945 he was made vice president of production, and a director. In 1946, when the company joined with Noranda Mines Ltd. of Canada in the formation of Noranda Copper & Brass Ltd. of Montreal, Mr. Batchelor became vice president of that company.

—o—

Robert E. Marshall has been elected secretary, Worthington Pump & Machinery Corp., Harrison, N. J., succeeding the late **C. Neal Barney.** Mr. Marshall has been associated with the corporation since 1947, serving as a member of the legal department, counselor on industrial relations, and assistant secretary. He will have headquarters in New York.

—o—

William F. Zerbe has been appointed vice president in charge of operations, a newly created position of Central Iron & Steel Co., Harrisburg, Pa., subsidiary of Barium Steel Corp. He formerly was general manager of operations, and will be succeeded in that post by **H. M. Jones,** his former assistant.

—o—

James H. Jewell, manager of apparatus sales, and **John M. McKibbin,** assistant to vice president and manager of advertising and sales promotion, Westinghouse Electric Corp., Pittsburgh, have been elected vice presidents of the corporation. **Herbert P. MacDonald,** treasury manager in the company's eastern district office, New York, was elected assistant treasurer of the corporation.

—o—

J. H. Beardsley has been appointed general manager, Bryant Chucking Grinder Co., Springfield, Vt., succeeding **J. B. Johnson,** who has retired as vice president and general manager, but continues as a director of the company. Mr. Beardsley had previous association with Hartford Special Machinery Co., and was with Jones & Lamson Machine Co. from 1938 to 1948. He was first associated with the Bryant company in 1946 as director and clerk of the corporation. In July, 1948, he actively joined the organization as assistant to the president.

—o—

E. E. Esgate has been appointed assistant to the general manager, Thew Shovel Co., Lorain, O., and will work under the direct supervision of **A. W. Smythe,** vice president and general manager. Mr. Esgate has been active in the development of equipment and methods of operation for use in the production and handling of pulpwood by the pulp and paper industry, serving as a staff member of the industry's association, and as an independent consultant operating the firm of E. E. Esgate Associates, New York.

—o—

Albert B. Agnew has been elected vice president in charge of operations of all plants of Laclede-Christy Co., St. Louis, and subsidiary companies. He has been vice president and general manager of Laclede-Christy Co. of Pennsylvania, a wholly owned subsidiary, for two years. He formerly was associated with Harbison-Walker Refractories Co. for over 30 years.

—o—

Marcel F. DeMuller has been named president of both Willys-Overland Export Corp., Toledo, O., and Willys-Overland of Canada Ltd. He has served as vice president and general manager of the export corporation, and vice president of the Canadian company for several years. **Delmar G. Roos,** first vice president, Willys-Overland Motors Corp., parent company, was added to the board of the

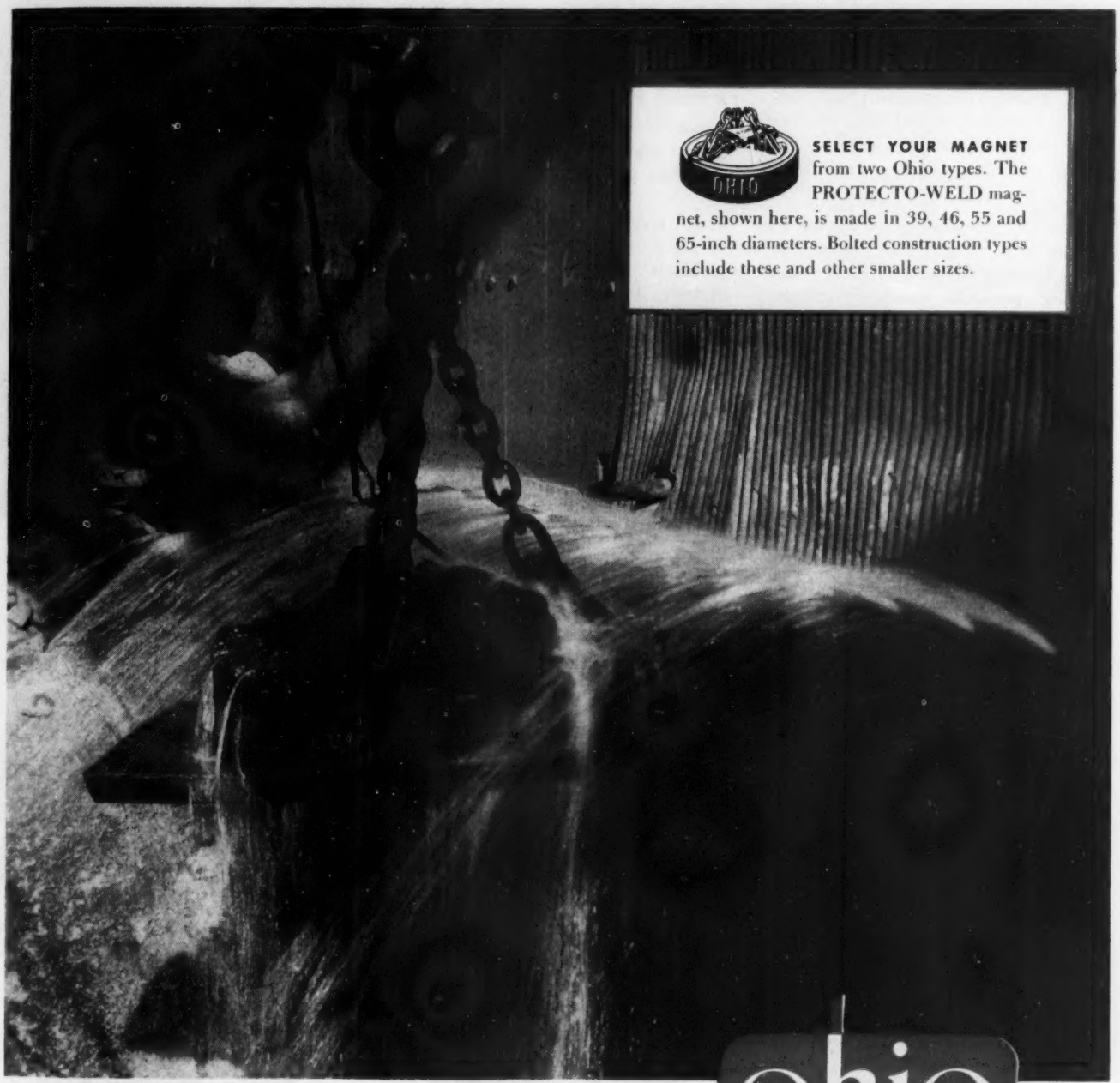
Is MOISTURE your magnet problem?

Here's an Ohio lifting magnet that operates underwater 50 percent of the time, retrieving hot crop-ends from a cooling pit. It is a standard Ohio bolted-type magnet which has not been waterproofed in any way!

This unusual application proves the extra margin of moisture protection built into every Ohio Magnet.

For longer magnet life and greater dependability, why not send your next order to Ohio—*25 years a leader in magnetic materials handling.*

Remember this picture next time you buy!



SELECT YOUR MAGNET from two Ohio types. The PROTECTO-WELD magnet, shown here, is made in 39, 46, 55 and 65-inch diameters. Bolted construction types include these and other smaller sizes.

THE OHIO ELECTRIC MFG. CO. • 5900 MAURICE AVENUE • CLEVELAND 4, OHIO

Ohio MAGNETS

A-1924

export corporation, and **George L. Palmer,** treasurer, was also made a vice president.

—o—

Dr. Max R. Burnell has been appointed medical consultant to General Motors Corp., Detroit, effective in July. He will succeed **Dr. Clarence D. Selby,** who is retiring after 14 years' service in that position.

—o—

Elected to membership in the Controllers Institute of America are: **Joseph F. DiFulgo,** comptroller of Luria Bros. & Co. Inc., Philadelphia; **William F. Herberg,** assistant comptroller of American Smelting & Refining Co., New York; **Otto H. Kessler Jr.,** secretary, controller of Stolper Steel Products Corp., Milwaukee; and **H. H. Tullis,** vice president and controller of Armco Steel Corp., Middletown, O.

—o—

Hill-Chase & Co. Inc., Philadelphia, announces appointment of **Robert C. Maentz** to be in charge of its Aluminum Division. He formerly was building products manager of the Eastern Division of Permanente Products Co. in its Cleveland office, and prior to that was district sales manager in Permanente's New York office.

—o—

George H. Tulley has been appointed in charge of metal powder sales, Metals Disintegrating Co. Inc., Elizabeth, N. J. He has been manager of metal powder sales of Metals Refining Division, Glidden Co.

—o—

A. A. Cambria has been appointed director of sales at Progressive Tool & Die Co., Worcester, Mass. He was associated with Lapointe Machine Tool Co. for several years as chief engineer. More recently, until joining Progressive Tool, he was New England district manager for U. S. Broach Co.

—o—

H. E. Heywood Jr. has been appointed assistant chief engineer of the Toledo, O., plant, National Supply Co., Pittsburgh. He joined the company in 1940, and has since been associated with the engineering department at Toledo.

—o—

Robert A. Morris, assistant to the president, Acme Steel Co., Chicago, has resigned in order to devote full time to his position as president of Ferguson-Lander Box Co., Chicago.

—o—

Walter R. Coley, a vice president of Leeds & Northrup Co., Philadelphia, has retired after 43 years' service with the company.

—o—

Tolbott G. Shipley has been appointed district manager, St. Louis car plant, American Car & Foundry Co.

—o—

A. J. Morrison has been appointed manager of the shaft and tunnel department, Dravo Corp.'s Contracting Division, Pittsburgh. He engineered various tunnel and shaft construction projects throughout the country for the company.

—o—

Gilfry Ward has been appointed vice president in charge of sales, American Manganese Steel Division, American Brake Shoe Co., New York. He will be located in Chicago Heights, Ill. Mr. Ward, who has been with Brake Shoe since 1928, has spent many years on both the East and West Coasts with its sales organization.

—o—

Promotions in the product engineering department, Oldsmobile Division, General Motors Corp., Detroit, include: **L. A. Kintigh,** formerly experimental engineer for Oldsmobile, named assistant chief engineer in charge of chassis, body and standards engineering. **D. C. Perkins,** associated with Oldsmobile since 1930, former chassis engineer, named experimental engineer succeeding Mr. Kintigh. **T. W. Loring,** named styling engineer for Oldsmobile, and **Stanford Landell** has been promoted to body engineer.

—o—

George L. Meyer Jr., a vice president of Stewart-Warner Corp., Chicago, since 1941, and an employee since 1907, has been elected to the board of directors, filling the vacancy created by the death of **Ralph M. Shaw.** Mr. Meyer is president of Bassick Co., Bridgeport, Conn., a subsidiary of Stewart-Warner, and also heads the Bassick-Sack Division at Winston-Salem, N. C.

—o—

John E. Menz has been appointed product manager, electrical conductor, to direct the sale of Kaiser Aluminum cable and other products produced at the Permanente Metals Corp.'s new rod, bar, wire and cable plant at Newark, O. His headquarters will continue to be in Oakland, Calif., Permanente's general sales office, where he formerly was sheet products manager and assistant general sales manager in charge of advertising and sales promotion.

—o—

James H. Fraser has been promoted to manager of engineering at the research and engineering laboratory, Poughkeepsie, N. Y., of International Business Machines Corp. He had previously served as assistant to **John C. McPherson,** vice president of the corporation. **Henry W. Reis Jr.** has been appointed to the newly created position of assistant sales manager of the Electric Typewriter Division, New York.

—o—

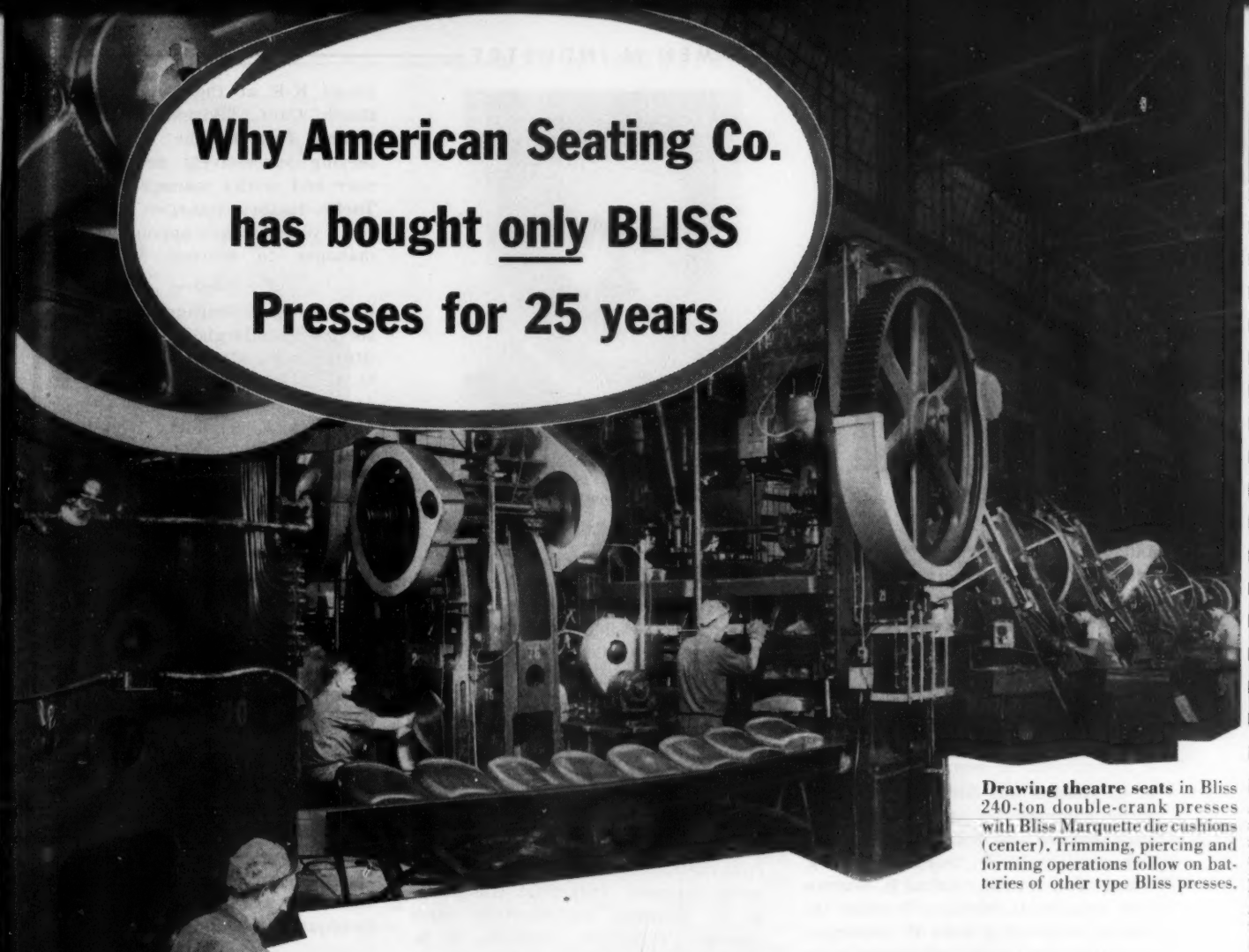
Leslie J. Woods has been appointed vice president, director of research

GEORGE H. TULLEY

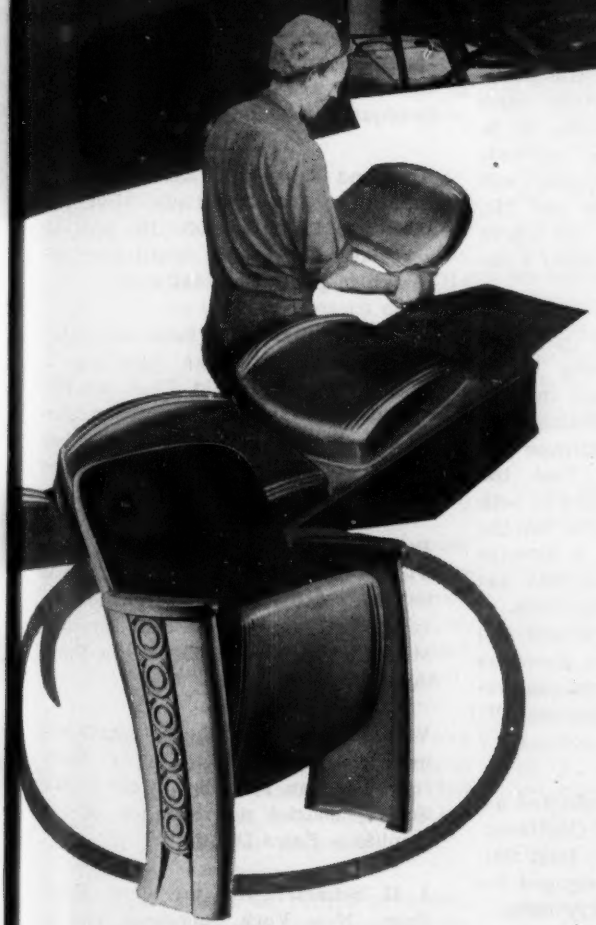
GILFRY WARD

JAMES H. FRASER

Why American Seating Co. has bought only BLISS Presses for 25 years



Drawing theatre seats in Bliss 240-ton double-crank presses with Bliss Marquette die cushions (center). Trimming, piercing and forming operations follow on batteries of other type Bliss presses.



Bodiform theatre seats consist of a variety of different stampings, all produced on Bliss equipment.

"Until 1924, we used many makes of presses, but since that year we have purchased only Bliss for our metal plant."

That's how the works engineer of the American Seating Company of Grand Rapids, Michigan, world's largest manufacturer of public seating, tells the story. Today this plant is 75% Bliss-equipped—63 Bliss-built presses in all, including inclinables, horn presses, arch presses, end-wheel, and straight-side single- and double-crank presses.

"What do we like most about Bliss? Well, I'd say it was that extra margin of dependability—and that includes more than press performance," adds the works engineer, who is responsible for the purchase and operation of all of American Seating's metal-working equipment.

Here's what he means by "more than press performance":

1. **Engineering counsel on equipment for new stampings.**
2. **Prompt assistance on presses "down" for repair.**
3. **Instruction of press-room personnel.**

A Bliss sales engineer will tell you of many similar case histories and help you get the most out of your pressed-metal production. Send for him today. See our Catalogue in SWEETS—or send for Bulletin 35-B.

E. W. BLISS COMPANY, TOLEDO 7, OHIO

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

WORKS AT: Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Derby, England; St. Ouen sur Seine, France. SALES OFFICES AT: Detroit, Mich.; New York, Rochester, N. Y.; Cleveland, Toledo, Salem, Ohio; Philadelphia, Pittsburgh, Pa.; Chicago, Ill.; New Haven, Conn.; Windsor, Ont.

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD

BLISS BUILT

J. C. RHOADS

D. W. DRUMMOND

and engineering, Philco Corp., Philadelphia. He has served in many executive positions since joining the company in 1925, and has been vice president of the Industrial Division since 1948. Mr. Woods will be assisted in his new position by **David B. Smith,** vice president, research and engineering.

—o—

J. C. Rhoads has been appointed division engineer, Locomotive Engineering Division, General Electric Co., Schenectady, N. Y., succeeding **A. J. Woodward,** retired. **Glenn B. Warren** was appointed manager, Turbine Divisions, succeeding **John W. Belanger,** recently named assistant general manager, apparatus department. **Edwin E. Parker** succeeds Mr. Warren as manager of engineering, Turbine Divisions. **C. W. La Pierre,** vice president in charge of engineering, American Machine & Foundry Co., New York, has been appointed assistant manager, General Electric's Aircraft Gas Turbine Divisions at Lynn, Mass.

—o—

Roy C. Brooks has been named manager of sales of the Memphis, Tenn., office of Tennessee Coal, Iron & Railroad Co., Birmingham.

—o—

Dr. Gustav Egloff, petroleum technologist and director of research, Universal Oil Products Co., Chicago, has been elected president, and **Donald N. Becker,** chief structural engineer, A. J. Boynton & Co., Chicago, has been elected treasurer, Western Society of Engineers.

—o—

George Russell has been appointed finance manager, Overseas Operations Division, General Motors Corp., Detroit. He has been assistant treasurer of General Motors since 1944. **Howard W. Megee** has been appointed assistant treasurer of the corporation to succeed Mr. Russell. Mr. Megee has been associated with the treasurer's office in New York since he joined the corporation in 1926, and since 1944 has been director of the financial analysis section.

—o—

D. W. Drummond has been named vice president, director of industrial chemical sales, and **S. L. Nevins** has been named vice president, director of agricultural chemical sales, Mathieson Chemical Corp., New York. **J. O. Logan** becomes sales manager, industrial chemicals, **R. J. Quinn,** assistant sales manager, industrial chemicals, **L. P. Thomas,** southwestern sales manager, industrial chemicals, **J. S. Whittington,** sales manager, agricultural chemicals. Mr. Thomas will be in Houston, Mr. Quinn and Mr. Whittington in Baltimore. All others will be located in the company's executive offices.

—o—

L. G. Bissell, chairman of the board of Mack Trucks Inc., Long Island City, New York, announces that he and **C. T. Ruhf** are relinquishing their respective positions as chairman and president of Mack, and that the board of directors has elected to both offices **E. D. Bransome,** who for the last five years has been a director of the company and since 1935 has been president of Vanadium Corp. of America, New York. Mr. Bissell and Mr. Ruhf will continue as members of the board, and Mr. Ruhf will remain with the company in a consulting capacity.

—o—

Jack M. Lutz has been appointed assistant to the president of Continental Foundry & Machine Co., East Chicago, Ind. He has been engaged for many years in steel industry sales.

—o—

John L. Hallett has been named general manager of Kaiser-Frazer Corp., Willow Run, Mich. He first joined K-F at the company's Long Beach, Calif., division, and went to Willow Run in the fall of 1946, serving successively as chief engineer and works manager. **John H. Tacke,** factory manager for the last two years, was appointed works manager to succeed Mr. Hallett.

—o—

F. O. Cooper, Chicago district senior service metallurgist, Carnegie-Illinois Steel Corp., Chicago, subsidiary of U. S. Steel Corp., has retired after 44 years' service, and is succeeded by **Peter A. Reynolds,** who has recently been with the company's Detroit metallurgical organization, and has been with Carnegie-Illinois since 1937.

—o—

Taylor Instrument Cos. has enlarged its sales staff in the Cleveland area with the addition of **Benjamin Steverman** and **Charles Tibbits** as industrial salesmen, and **John Grotzinger,** formerly handling sales and service work, now assigned to field engineering.

—o—

R. Bruce McKenzie has been appointed sales engineer, Butterfield Division, Union Twist Drill Co., Derby Line, Vt., manufacturer of taps, dies, reamers and other cutting tools. He will cover California, with headquarters at Los Angeles.

—o—

Raymond J. Donley has joined the research staff of Battelle Memorial Institute, Columbus, O. He will be associated with the institute's research in physical metallurgy.

—o—

W. G. Rouillard has been appointed manager of American Smelting & Refining Co.'s Garfield, Utah, smelter operations. **Raymond Thompson,** former assistant superintendent, has been named to succeed Mr. Rouillard as superintendent of the smelter.

—o—

Peter Storti, formerly with Dalmo Victor Co., San Carlos, Calif., has been appointed rotary oil burner development engineer for Iron Fireman Mfg. Co., with headquarters in Portland, Oreg.

—o—

Vern L. Hobson has been transferred by General Electric Supply Corp. from the San Francisco staff to the Seattle district as manager of the Appliance Sales Division.

—o—

J. H. Schaefer, vice president, Ethyl Corp., New York, has been elected president, Industrial Research Institute Inc., New York, and **C. F. Rassweiler,** vice president for research and development, Johns-Manville

HARRY A. FOHL

Named chief engineer, Lukens Steel Co., Coatesville, Pa. Noted in STEEL, May 30 issue, p. 52

I. C. MAUST

Appointed sales manager, Precision Gear Division, Foote Bros. Gear & Machine Corp., Chicago. Noted in STEEL, May 30 issue, p. 48

ANDREW HOOD

Elected secretary, Hudson Motor Car Co., Detroit, and continues as treasurer. Noted in STEEL, May 30 issue, P. 52

Corp., was elected vice president. **G. G. Worthington** was reappointed secretary-treasurer. **Fred Olsen,** director of research and development, Olin Industries Inc., and **H. N. Stephens,** research director, Minnesota Mining & Mfg. Co., were elected to three-year terms on the board of directors.

—o—

Raymond J. Casey has been appointed co-ordinator of industrial relations and training of Midvale Co., Philadelphia, reporting directly to **L. W. Metzger,** executive vice president.

—o—

Arthur M. Jorgensen has been appointed sales engineer for the Magnolia Metal Co. to cover the Wisconsin and Minnesota territory. He was, at one time, a research engineer at Battelle Memorial Institute, Columbus, O.

—o—

Pontiac Motor Division, General Motors Corp., Pontiac, Mich., announces establishment of two more field sales zone offices. **Sidney G. Whiting,** former Pontiac zone assistant manager, will head the new Charlotte, N. C., office. Other Charlotte department heads are: **Thomas L. King,** business management manager; **Robert A. Jerrue,** service manager; **Eugene W. Smith Jr.,** parts and accessories merchandising manager; **Charles P. Terhune,** office manager and car distributor, and **John S. Airheart,** service instructor. A new Milwaukee office will be headed by former Minneapolis zone manager **George D. Dennis. William M. Mustard,** business management manager; **Verne E. Ovens,** service manager; **C. W. Edmonston Jr.,** parts and accessories merchandising manager; **George E. Bourke,** office manager and car distributor; and **William R. Candler,** service instructor; are the department heads. **J. T. Omtvedt,** former Minneapolis assistant manager, has been named zone manager for that area.

—o—

Leigh Willard, board chairman, Interlake Iron Corp., Cleveland, has joined the board of directors of ATF Inc., New York.

—o—

W. J. O'Connor has retired as general manager of the Utah department of American Smelting & Refining Co., New York, and is succeeded by **R. D. Bradford,** manager of the Selby, Calif., operations.

—o—

Robert S. Mars, president, W. P. & R. S. Mars Co., Duluth, has been elected president of the National Welding Supply Association.

—o—

Thomas R. Clark, vice president, American Express Co., has been elected to the board of directors, American Arch Co., New York.

OBITUARIES . . .

Henry W. Kimmel, 72, vice president, Taylor Instrument Cos., Rochester, died May 26. He was named president of Taylor Instrument Cos. of Canada Ltd., and vice president of the Rochester firm 14 years ago.

—o—

George Harris Sr., 89, a founder and vice president, Harris Structural Steel Co., New Market, N. J., died May 30. He had been active in the steel business for 33 years.

—o—

George Poulsen, 66, retired president, Poulsen & Narden Inc., tool and die makers, Los Angeles, died May 17.

—o—

William G. McGuire, 62, superintendent, Chicago Fabricating Works, Chicago, Bethlehem Steel Co., died at his home in Chicago May 23.

—o—

Charles O. Barks Sr., 75, retired superintendent, Sloss-Sheffield Steel & Iron Co., Birmingham, died May 20.

—o—

James A. Carey, 57, retired vice president and general manager, Walker-Turner Co. Inc., East Plainfield, N. J., now a division of Kearney-Trecker Corp., Milwaukee, died recently in New York after a brief illness.

—o—

James MacNaughton, 85, former president, Calumet & Hecla Consolidated Copper Co., Boston, died May 23 at his home in Calumet, Mich. He was head of the firm for 37 years, first as general manager and later, from 1926 to 1941, as president.

—o—

J. Lewis Hay, 82, former president, Hay Foundry & Iron Works, Newark, N. J., died May 27.

—o—

Albert W. Todd, 65, president United Shoe Machinery Co., Boston, died May 26.

—o—

Percy T. Laws, 74, retired general manager of the Birmingham plant, U. S. Pipe & Foundry Co., died May 27.

—o—

John T. McEnroe, 56, president and owner, John T. McEnroe Co., Chicago ferrous scrap brokerage firm, and well known in steel foundry trade circles, died May 23.

You Will Cut Costs!...Specify

FLASH-BUTT WELDED RINGS & BANDS

by AMERICAN WELDING

Make better products more profitably by cutting your production costs with American Welding Flash-Butt Welded Rings and Bands.

Our "Controlled Technique" is your assurance of top quality and low cost.

Both ferrous and non-ferrous metals in standard shapes or special mill sections are easily adapted to American Welding know-how and craftsmanship. Send us your prints, specifications and quantities for prompt quotations.

Send for 16 page illustrated catalog.

THE AW AMERICAN WELDING AND MANUFACTURING COMPANY

110 DIETZ ROAD • WARREN, OHIO

Engineering News . . . AT A GLANCE

MEASURES MAGNETIC FIELDS ACCURATELY— Method of measuring the proton's gyromagnetic ratio, developed by the National Bureau of Standards, Washington, is reported to provide an accurate secondary standard for magnetic fields. In the past, laboratory measurements involving both magnetic and electric fields were limited by the low accuracy of magnetic measurements. Now the situation is reversed and magnetic fields can be measured more accurately than electric fields by the new technique. Development, according to the bureau, will be especially useful in the design and development of scientific and industrial apparatus employing magnetic fields where it is important to know accurately the spatial distribution of the field.

OFFSET JOINING— In producing ventilators in the plant of Donley Bros. Co., Cleveland, components of the unit are spot welded by means of offset electrodes. The operation involves the use of a special jig that insures finished units that are rigid and of uniform strength and dimensions. The technique enables operators to place the required 100 welds on each unit at desired points to give the highest production rate without sacrificing quality.

TOOL LIFE EXTENDER— Process for prolonging life of blocks per hour are tapped at 100 per cent efficiency by a special multiple-spindle machine recently delivered to a large auto maker by Cross Co., Detroit. The unit includes four stations—the first and fourth for loading and unloading respectively, the second and third for tapping operations. During the operations, operator merely positions each block in the leading station and presses the cycle button. Parts are automatically machined and transferred from station to station.

LIQUID STAINLESS— Stainless steel in liquid form now can be appiled to any surface, much in the same manner as a coat of paint, according to the Plastics Division of Lockrey Co., College Point, N. Y. Through a new process developed by the company, stainless steel is broken down into flakes of microscopic size so fine that it flows almost like a liquid, and this material is incorporated in a liquid plastic and solvent to bring it to brushing consistency. Combined properties of the two materials is said to make the finish about as near to being the long looked-for "permanent finish" as modern science is able to produce. It can be used on metal as well as wood products.

BLOCK TAPPER— Pan rail and ends of 130 cylinder cutting tools, dies, gages and other wear parts used by Electrolized Tap Corp., Cleveland, is reported to effect savings up to 1500 per cent on tool life. It involves two procedures—a high frequency treatment that raises fatigue point of dies and cutting tools, and a process of vaporization and condensation by which a layer of very hard new alloy is deposited on cutting edges or working surfaces. Thickness of metallic "skin" provided by the method, it is reported, varies from 0.00003 to 0.00005-inch so tools that must be accurate to ten-thousandths of an inch can be plated after final machining without affecting their dimensional accuracy.

BETTER ENGINEERS—To serve industry better and to assist in keeping our democratic way of life in a highly mechanized world, engineering schools must provide their graduates with the latest production techniques and methods so that these potential engineers are prepared to maintain American industrial supremacy. At Purdue University, Lafayette, Ind., the "budding" engineer is about to be introduced to the outside engineering world through a new and modern $2 million machine tool laboratory. Through it, he will have an opportunity to study the speed with which metals and other materials of construction can be machined and the importance this speed has on production costs in practically all industries. (p. 98)

BORON'S ACTION — Previously, it was shown that effectiveness of boron in enhancing hardenability of certain steels depended on the form of the boron at time of quenching and not necessarily on total amount of the element present. Evidence for the above was obtained during the national emergency when little attention could be given to the mechanism of the effect of boron on hardenability. Recently, however, investigators at the National Bureau of Standards, Washington, discovered convincing evidence that the action of boron in increasing hardenability is due entirely to a solid solution effect at heat treating temperatures. (p. 105)

"COLD ROLLING" HISTORY—Real beginning of the cold rolling of iron and steel as an industry may be said to date from about 1830 with the manufacture and use of steel reeds by weavers in Germany, Charles L. McGranahan, Jones & Laughlin Steel Corp., reports. Reeds were of high-carbon steel wire, flattened by cold rolling in exactly the same manner as current practice followed in the flat wire industry today. Invention of the continuous rod and looping mill about 1860 made it possible to produce rods and narrow flat sections used extensively to bind barrels and buckets. In its earlier stages, he points out, strip steel was merely a special product of the merchant mill and was rolled along with other thin flat sections. Later, increasing demand brought it into the specialty class and separate mills were built for its production. (p. 106)

Purdue University MACHINE TOOL

By O. D. LASCOE
Associate Professor, Manufacturing Processes
Purdue University
Lafayette, Ind.

. . . keeps pace with improvements in design of production equipment

By replacing an obsolescent "machine shop" with a completely modern "laboratory," Purdue expects to do a better job of helping its engineering students to bridge the gap between the college shop and modern industrial practices. Physical equipment is valued at about $2 million

LIKE most engineering schools in the United States, Purdue University, Lafayette, Ind., offers to engineering students courses of study in various phases of manufacturing processes. In this modern concept of engineering education, the machine tool laboratory, formerly referred to as the machine shop, has come to occupy a prominent position. Recognizing that its facilities were over-age and thus inadequate for serving their intended purpose, the university set out some time ago to re-equip and expand this department. This undertaking has just been completed, with the result that the school now possesses a machine tool laboratory of outstanding character and scope.

As so often happens to educational and public institutions, Purdue's laboratories and physical equipment for teaching manufacturing processes had become out-of-date and were long overdue for replacement. This was particularly true of the machine shop. Today its refurbishment is setting the pace for extensive overhauling of other laboratories.

No Slapping Belts—Not so long ago, the machine shop was a maze of unsightly overhead lineshafts, slapping belts and outmoded machine tools. The prospective engineers were exposed to the art of metal cutting in this environment to become acquainted with a number of different machines used to produce metal parts. Graduating engineers were expected to assimilate priceless concepts of machine shop knowledge known by the Fords and Knudsens several decades ago.

These same students were to be hired by our modern industrialists in production jobs which required utmost training and experience in order to solve complicated tool engineering problems and to become familiar with the productivity of newer machinery which we have in our modern plants. Larger plants and corporations soon learned that, in order to supplement some of the missing knowledge, training programs of their own had to be established to make the engineer more useful.

Fig. 4—Drilling, tapping, sawing, shaping, filing machines: An excellent area for defining shaping, slotting, metal sawing, metal filing (band and die), drilling (sensitive, vertical, radial, multiple-spindle, multiple-drill head) and tapping. If the basic function of each of these machines is well understood, an engineer will be better equipped to study machinability and tool engineering. Among machine tool builders represented: Smith & Mills, Snow, Gould & Eberhardt, Emmco, Atlas, DoAll, Cincinnati Bickford. Edlund, Shaperite, Oliver, Delta, and Walker-Turner

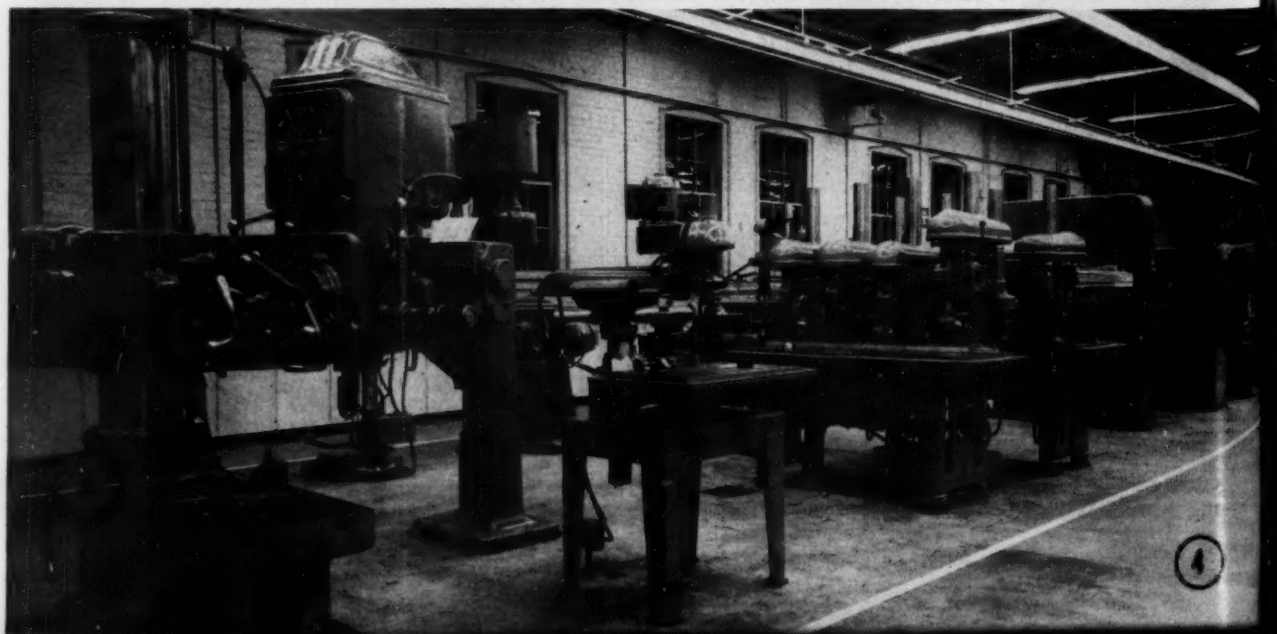


Fig. 1—Overall view of basic machine tools division, showing engine lathes and milling, drilling, sawing, shaping, and filing machines. Basic fundamentals of machining operations, types of cutting tools and speeds and feeds applied to cast iron, alloyed steels and nonferrous materials will be emphasized here

Fig. 2—These standard type engine lathes, representing products of some well-known builders, are grouped so an engineer can compare design, master different operations possible with single point tools and learn work capabilities possible by the variety and size of machines. Machine tool builders represented: Monarch, LeBlond, Hendey, American, South Bend and Pratt & Whitney

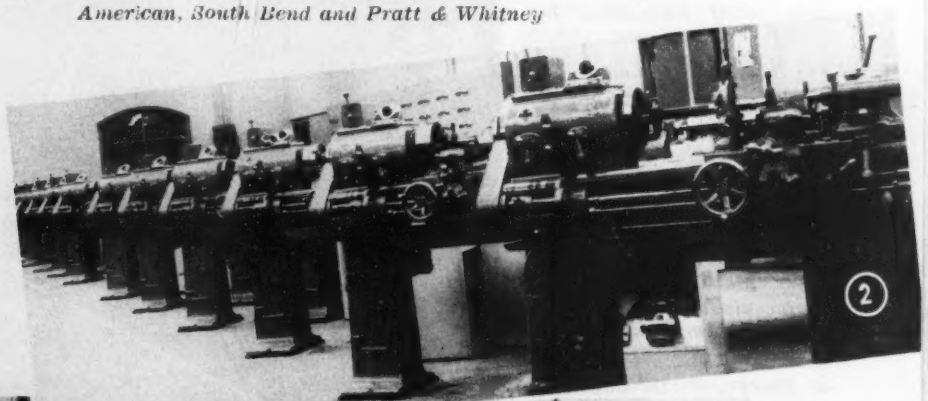
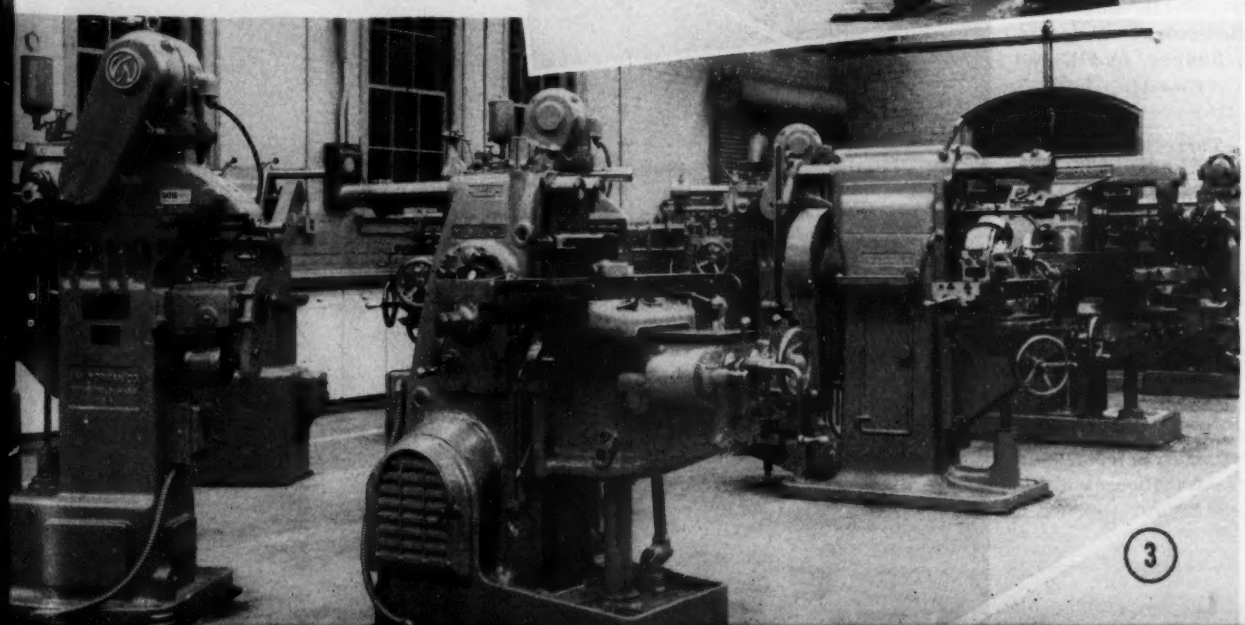


Fig. 3—Smaller knee and column-type milling machines for introduction to unit operations and multiple-edged cutting tools. Machines of Cincinnati Milling, Van Norman, Kearney & Trecker, Brown & Sharpe, Burke, Sheldon and Nichols are represented



MACHINE TOOL LABORATORY

With an old shop setup, very little was done to bridge the gap between the college shop and modern industrial practices. By not keeping abreast of progress, practical instruction concerning machine tools and modern alloys, once an important portion of the engineer's curriculum, was rapidly degenerating.

Evolution of the mechanical engineer began during development of the steam engine, because the technical problems in the design of the engines and machine tools grew beyond the scope of the ordinary mechanic. The foremen and mechanics of this age quite often were left with the assignment of producing the machines and controlling the flow of materials through the plant; however, this stage was quickly outgrown in manufacturing. Industrial engineers like F. W. Taylor soon learned to analyze manufacturing as a science, and, thus, continued its development.

Latest Techniques—Engineering schools, to serve industry better and to assist in keeping our democratic way of life in a highly mechanized world, need to provide their graduates with the latest production techniques and methods so that these potential engineers can be prepared to maintain our American industrial supremacy.

The Purdue engineer is about to be introduced to the outside engineering world through a new and modern machine tool laboratory. Here the mechanical engineer will have an opportunity to study the speed with which metals and other materials of construction can be machined and the importance this

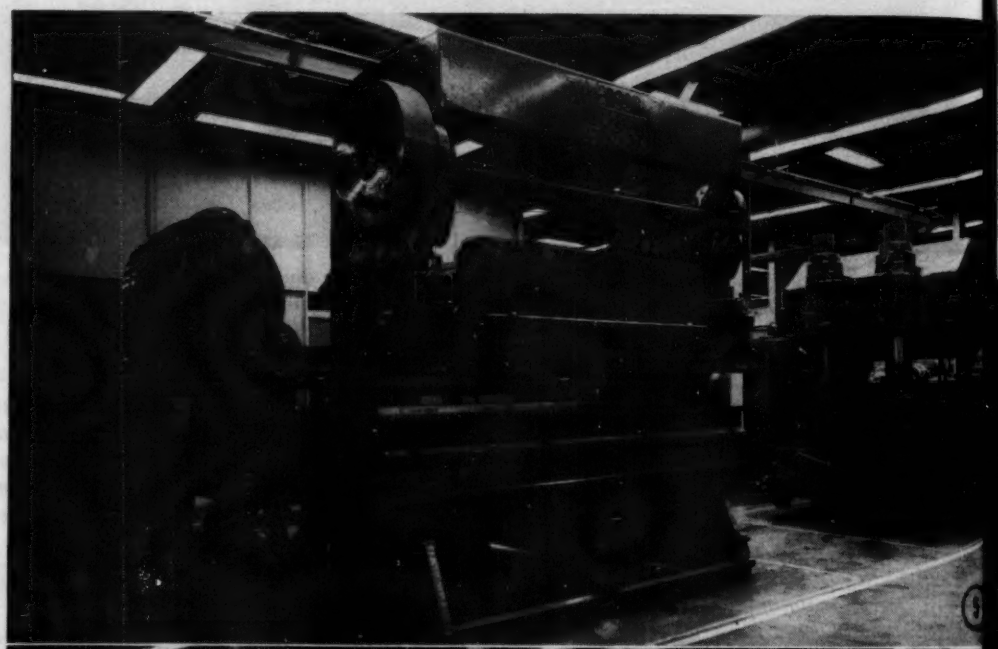


Fig. 5—Stamping and forming machines: To familiarize engineers with basic actions which dies perform on materials (cutting, forming and pressing), mechanical and hydraulic presses are grouped in this area. Theory of shape cutting and shape flowing with dies and forms applied to a variety of materials will teach machine capacities and limitations. Machine tool builders represented: Bliss, Toledo, L. & J. Press, Verson, White, Perkins, Logansport, K. R. Wilson, Whitney-Jensen, and Laboratory Specialties Inc.

Fig. 6—Standard and production grinders are grouped as a unit so that basic functions of cylindrical and planetary grinders can be mastered. A student will learn rapidly by doing operations, then comparing one process with another. Machine tool builders represented: Cincinnati, Landis, Heald, Taft-Pierce, Hanchett, DoAll, Norton, Brown & Sharpe, Porter-Cable, Rivett, Hammond, Boyar-Schultz, Sunnen, and Grand Rapids

Fig. 7—Turret lathes and automatics that meet requirements of mass production beyond capacity of the engine lathe, are grouped in this area. Operations tooled into sequence and complex tooling will give an engineer a taste of production. Machine tool builders represented: Gisholt, Brown & Sharpe, Wickman, Heald, Simmons, Hardinge, Rivett, Warner & Swasey and Rogers

speed has on production costs in practically all industries.

Industry depends on modern tools; costs would be higher if we had to depend on the cutting techniques and materials of only a few decades past. Since metallurgists have made it possible to produce materials with a variety of physical properties to suit many new conditions, the metallurgical engineer will see, first hand, the effects of alloying elements on production cutting tools.

The industrial engineer will be able to apply methods and motion and time study to production. The science of motion study is showing industry how to increase production without the driving tactics used in the past. With the accuracy of the work no longer depending on the skills of the operator but on the accuracy of the tools, all of our engineers should be well acquainted with modern manufacturing methods.

The electrical engineer will have the opportunity to observe transmission and application of electrical energy indirectly to reciprocating and rotating motions. Electronic controls are greatly affecting the design and application of our modern tools.

Safety Practices—Modern safety methods, too, will have an important place in Purdue's laboratory, since more and more engineers and future plant executives are realizing that the practice of the fundamentals of industrial safety reduces accidents, saves lives, and represents an economic gain of substantial proportion. With this unusual setup, adequate training in the new machine shop will be available to every engineering student at Purdue.

With the aid of surplus property, Purdue University has revamped an old building into a modern plant layout and has grouped the equipment so that the engineering objectives outlined can be met. Floor plan of the laboratory layout is illustrated. Valuation of the equipment installed approximates $2 million.

Fundamentals of machine tools boil down to the necessity of producing and controlling motion in the tool and workpiece to perform a given type of operation efficiently. Purdue's laboratory is divided into two main divisions to provide for these fundamentals.

Two Main Divisions—These two principal divisions are:

(a) Basic machine tools, which change the shape, size, or finish of the workpiece by cutting material from it. Each operation is on the same

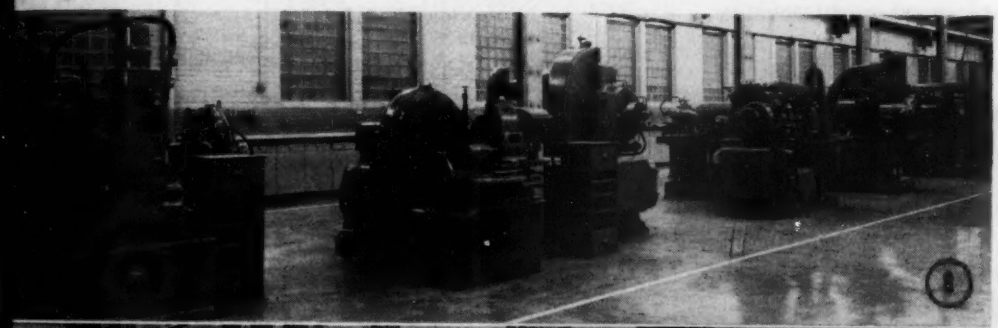


Fig. 8—Gearing, milling and hobbing: An area with a wide variety of production techniques. Bed-type mills in the simplex and duplex design, thread mills and large knee and column-type machines are used to handle carbide milling. Machine tool builders represented: Barber-Colman, Fellows, Gleason, Pratt & Whitney, Cincinnati, Kearney & Trecker, Kent-Owens and Brown & Sharpe

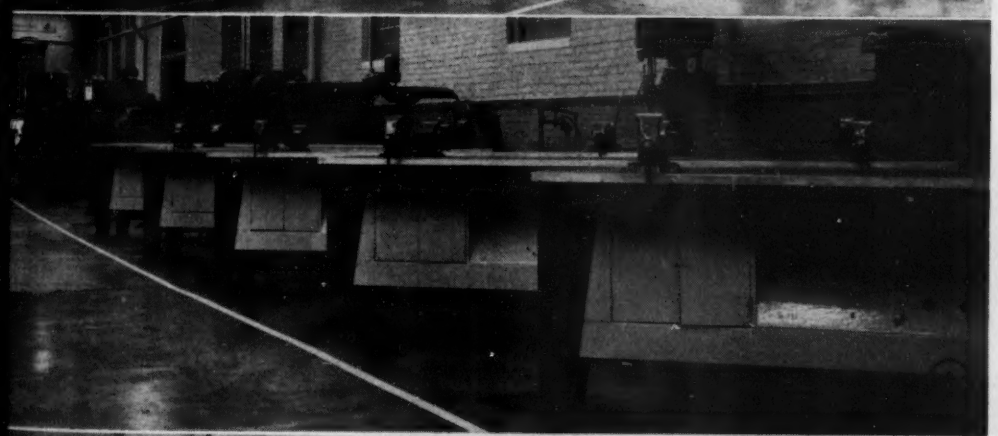
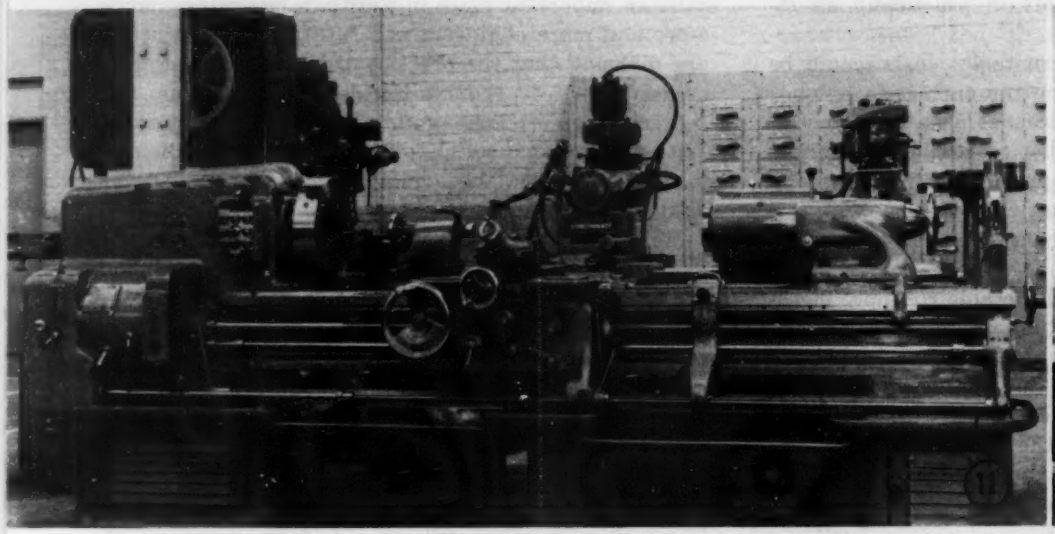


Fig. 9—Aircraft sheet metal: This area is set up to familiarize aeronautical engineers with the working properties of aluminum alloys, and the tooling used in aircraft fabrication, namely, routing, shrinking, sawing, shearing, forming, spot welding, drilling and nibbling. Machine tool builders represented: Cincinnati Shaper, Onsrud, Erco, Campbell, Walker-Turner, Northill, Knight, Edlund, Delta, Chicago Pneumatic and Wiedemann

Fig. 10—Lecture room: This large class room, between the basic machine tools and production processes, has a capacity of 100 students



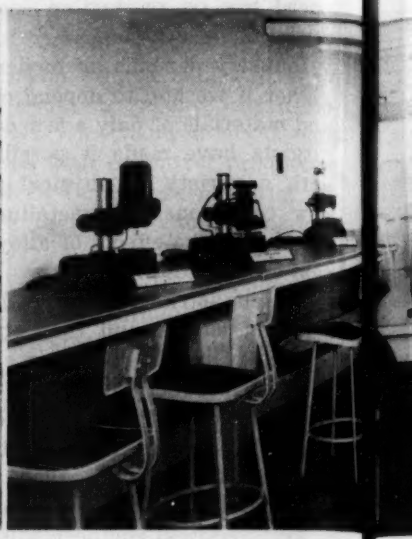


Fig. 11—*Profiling and duplicating: An adequate area for familiarizing engineering students with these new processes. Research on metal sawing and turning will also be conducted. Machine tool builders represented: LeBlond, Cincinnati Milling, American, Bridgeport, Gorton and Knight*

Fig. 12—*Equipment in gage laboratory is owned by United States Navy. An engineer will have an opportunity to get acquainted with such precision measuring units as the 80-inch measuring machines, lead checks, angular measuring machines, toolmakers' microscopes, electrigages and precision measuring instruments such as micrometers, vernier, height gages, supermicrometers, comparators, optical flats and gage blocks. Manufacturers represented: Vinco, Pratt & Whitney, Sheffield, Federal, Bausch & Lomb*

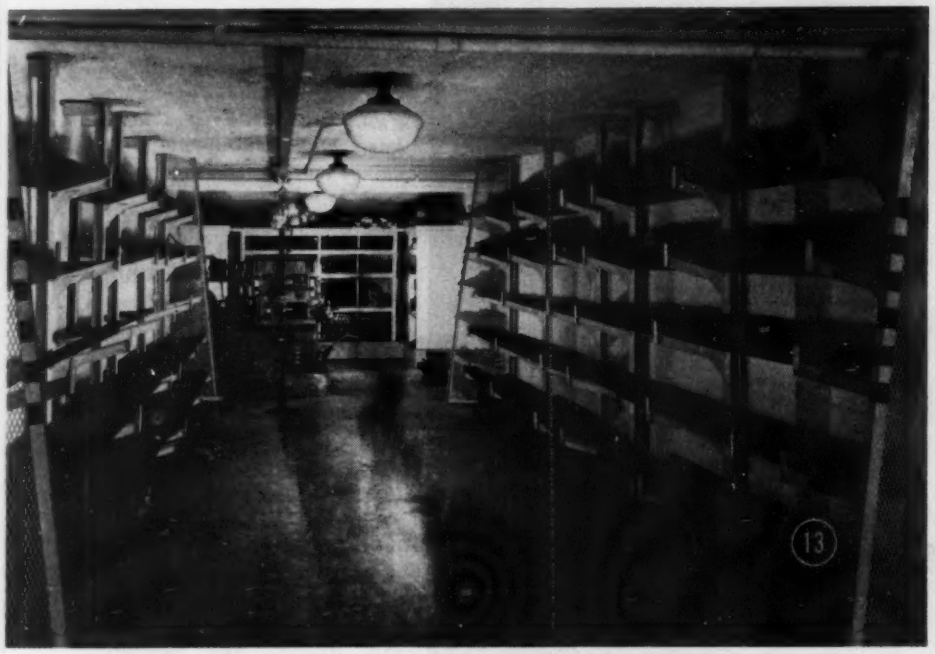
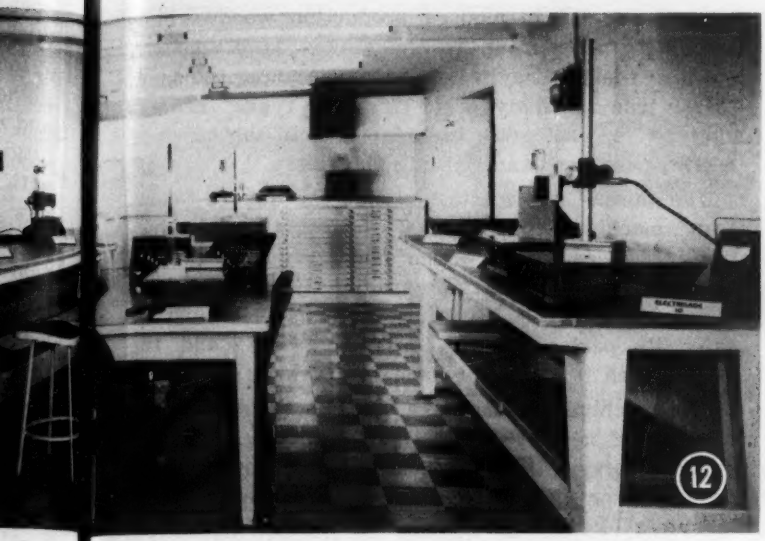


Fig. 13 — *Heavy barstock is stored in racks and provision is made for transporting material to the saw by means of a monorail. This will be a lecture room for teaching students material preparation and safe handling*

Fig. 14—*To teach tool engineering and the importance of production processes, elaborate jigs, fixtures and dies are most essential. Jigs are grouped and identified according to their design and application. Dies and fixtures are stored so as to illustrate a particular operation or part for which they are designed*



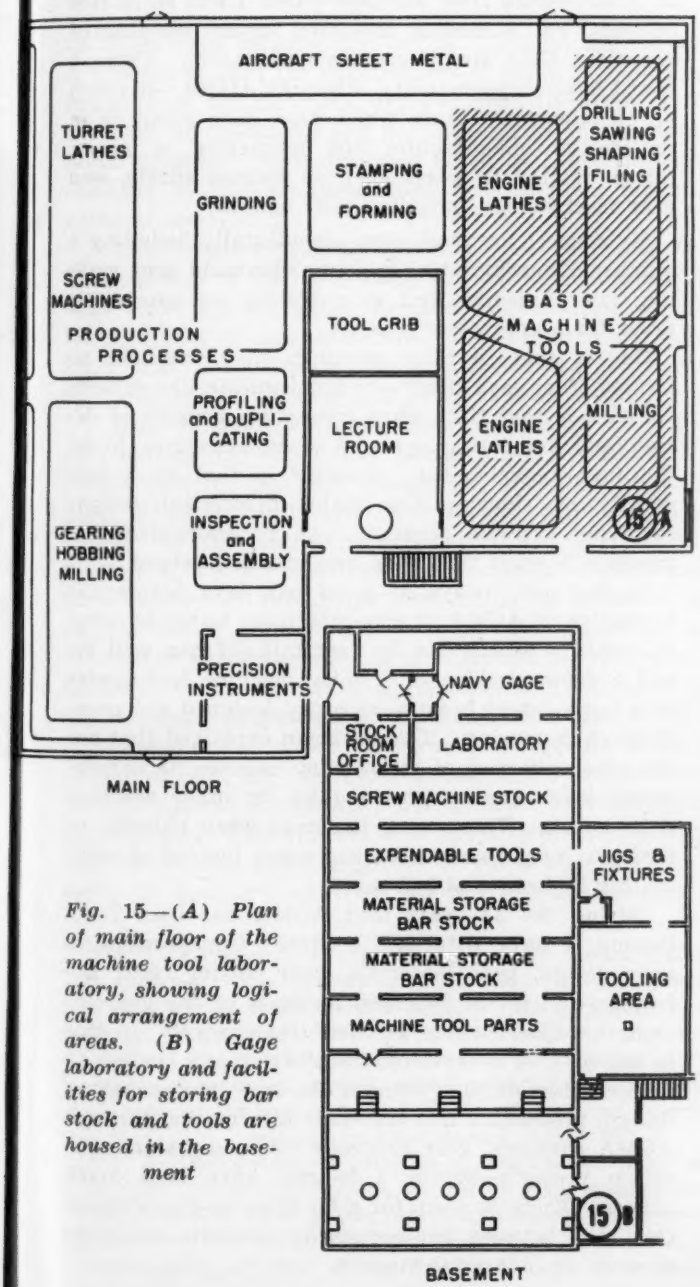


Fig. 15—(A) Plan of main floor of the machine tool laboratory, showing logical arrangement of areas. (B) Gage laboratory and facilities for storing bar stock and tools are housed in the basement

basic principle: Applying motion to the tool on the workpiece, while the two are in contact.

(b) Production processes, illustrating compound tooling used in an ever-increasing tempo in production.

In the basic machine tools division, shown pictorially in Figs. 1 to 4, inclusive, general purpose machines are grouped into areas representing a family of machines. The prospective engineer will be able to evaluate the advantages of a particular machine tool and weigh them against those of another type, thereby acquiring a clear understanding of the fundamental principles of each machine.

In the production processes, shown pictorially in Figs. 5 to 11, inclusive, the more complicated machines are grouped into several areas. The manufacturing of metal products requires many cutting tools, standard and special. These machine tools will make good tooling examples for jigs, fixtures, punches, dies and broaches.

Tool Crib—Conveniently located between the basic machine tools and the production processes is the tool crib. Safety in the storage and accessibility of the tools has been carefully planned. To eliminate congestion in checking out tools from the tool crib, cabinets have been placed beside the machines containing necessary tools and accessories. Still other tools, such as milling cutters, will be classified according to applications and neatly arranged on portable carts which will be available for lecture demonstrations in the main lecture room.

Underneath the machine tool laboratory a model storage room has been set up around a basement which was ordinarily used for storing miscellaneous material. In order to operate the machine tool laboratory, according to the plant layout, expendable tools, materials, supplies, jigs, fixtures and dies will be grouped and classified. Efficient records and control of all of these becomes part of any well-planned organization.

The basement is divided into several bays, as indicated in the floor plan. Each bay has been planned and set up to form a display of cutting tools, screw machine stock, ferrous and nonferrous castings and heavy bar stock, along with a temperature controlled gage laboratory. This gage laboratory will be used for master gaging and research in dimensional control.

Color as a production tool in modern industry is receiving deserved attention from engineers and plant managers. The ceilings, walls and dadoes in the shop have been painted an eye-rest green color, and appropriate fluorescent lights have been installed, since light and color should be closely associated. The machine tools have been refinished a light gray color. Traffic lanes, moving cranes, stairs, fire extinguishers and electrical panels and outlets are painted with the color recommended by the National Safety Council.

Foresight in sponsoring and developing Purdue's manufacturing processes and the new machine tool laboratory, in particular, is attributed to Dr. A. A. Potter, dean of the schools of engineering, and his associates.

SEEN AND HEARD IN THE *Machinery Field*

By GUY HUBBARD
Machine Tool Editor

MECHANICAL INGENUITY: In these interesting days when we hear and read and see so much of electronics and hydraulics and pneumatics in connection with machine tools, are we perhaps losing sight of the fact that mechanical ingenuity of the good old Yankee variety still has a place—and a very important place—in the design of metalworking machinery?

That question came into my mind during a recent visit to Bryant Chucking Grinder Co., Springfield, Vermont, whose engineers are accomplishing notable things electronically and with high-cycle currents, but have at the same time retained their grip on mechanical ingenuity.

The thing which re-aroused my interest and renewed my faith in mechanical ingenuity was a multi-operation Bryant internal grinder which had been tooled up for a certain customer who was old-fashioned enough to prefer cam operation. Therefore the machine was designed with a camshaft at the back on which a varying number of disk cams can be installed to suit the work. These control the machine cycle and the loading and unloading of the work through bell cranks, connecting rods and levers.

At the time of my visit, this machine was being demonstrated to another prospect—an important man from one of the big automobile companies. Somewhat apologetically, the engineer unveiled the cam, bell crank, connecting rod and lever system with the comment: "This may look like something designed by Rube Goldberg, but it is what our customer wants—and it works."

"Don't apologize for it," said the automobile man, "this may be just what I want. I understand this system. A 15 year old boy can understand it. I can set it up and adjust it. So can a 15 year old boy. Don't discount those advantages. They are mighty important in some of my departments where quick setups and quick servicing must be done by men whose comprehension is practical, not theoretical."

RISING LEVEL OF QUALITY: A number of machine tool builders whom I recently have visited have been taking on subcontract work in building machines other than machine tools. In the past they have found that the general quality of such outside work has been somewhat below machine tool standards. Today that no longer is true.

For example, several of my friends in the machine tool industry lately have been doing subcontract work on woodworking machinery. Rather to their surprise they discovered that the materials and quality of work demanded in modern production woodworking machinery is well up to the standards of modern machine tools. They would have discovered the same to be true of many other "outside types" of machinery. In fact some of them have in the cases of textile machinery and printing machinery.

The fact of the matter is that the day of "claptrap" machinery in all kinds of competitive production industries is over. Such machinery must operate at high speeds; it must operate quietly and with minimum vibration; it must be dependable; it must be safe; its parts must be interchangeable; and the work which it turns out must be uniform in quality.

The machine tool industry can take a lot of credit for having made possible this improvement in machinery outside its own field, for the simple reason that machine tools are the machines which create all machines—including themselves.

SOME THOUGHTS ON GEARS: When this issue of STEEL comes from the post office, I will be at Hot Springs, Va., attending the 33rd annual meeting of American Gear Manufacturers Association. Twice a year I have an opportunity—through AGMA—to catch up on important things which have been going on in the design, manufacture and marketing of gears, things related to gears such as splined shafts, and gear mechanisms, including gear motors.

My respect for these men—incidentally including a number of machine tool builders who build gear making, gear finishing and gear testing equipment—is great for a number of reasons.

One is that in their meetings they withhold no secrets from each other—or from guests like myself. Another is that they allow competing systems of design and competing systems of manufacture to be thoroughly expounded. Another is that they constantly are showing how highly theoretical designs involving extreme accuracy, can be translated into practice in ways that shop men can understand.

In the not always so good old days before the formation of AGMA, it was customary to try to cover up gearing deficiencies by fast talk. I can well recall a demonstration of a noisy machine tool—noisy to a large extent because of badly designed and poorly finished gearing. The salesman explained that the machine only seemed to be noisy because its natural sound level was not covered up by other machine shop noises. Those were the days when chloride of lime was used to cover up bad odors instead of eliminating the source of bad odors.

During the 33 years that AGMA has been functioning, I have witnessed a steady improvement in gear design, gear materials, gear cutting, gear finishing—and in the business methods of the gear industry. America has profited tremendously by this in the way of everything from better egg beaters to better automobiles. Without the free interchange of design, production and economic information through AGMA channels, gear progress—including standardization projects—would, I believe, have been much slower. There is room for a lot more co-operation of this kind between the competing elements which go to make up industrial America.

How Boron Affects STEEL HARDENABILITY

Results of Bureau of Standards' investigations strongly support the conclusion that boron's effectiveness in enhancing hardenability of certain steels is due entirely to its action while in solid solution in austenite

IN a previous investigation at the National Bureau of Standards, it was shown that the effectiveness of boron in enhancing the hardenability of certain steels depends upon the form of the boron at the time of quenching and not necessarily on the total amount of boron present.[1] This evidence, based on a determination of hardenability by the end-quench test, was obtained during a period of national emergency.

The bureau's program has since been extended to include an investigation of the hardenability of boron-treated alloys and steels with particular attention directed to the action of boron on the hardenability of these materials. This research has shown convincingly that the action of boron in increasing the hardenability is due entirely to a solid solution effect at heat-treating temperatures.[2]

High-purity iron-carbon alloys containing 0.3, 0.5 and 0.7 per cent carbon and other high purity alloys containing 0.4 per cent carbon and 0.7 per cent manganese, each type without and with about 0.002 per cent boron, were prepared for use in this investigation. In addition several commercial and open hearth steels (0.4 per cent C, 1.6 per cent Mn) were included. Determinations of the hardenability of the alloys were made in terms of the "critical cooling rate." (The "critical cooling rate'" is defined as the slowest rate at which the alloy or steel can be cooled and be completely hardened.) The standard end-quench test was used for evaluating the same properties of the iron-carbon-manganese alloys and commercial steels. Specimens prepared from the alloys in the conditions as cast, as forged and homogenized, and as heat treated in various ways to precipitate a boron constituent were studied metallographically. Experiments were made to determine whether boron was lost during decarburization of steels and rate of diffusion of boron in austenite of these steels. (*Please turn to Page* 135)

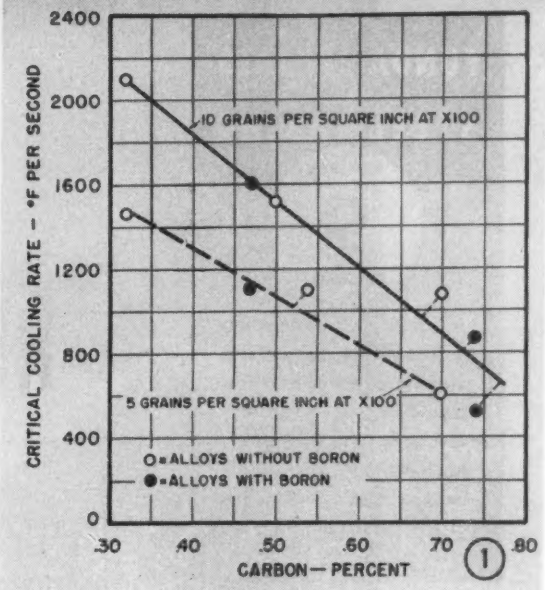


Fig. 1—Relation of critical cooling rate to carbon content of the iron-carbon alloy specimens prepared from homogenized bars. Note that when the critical cooling rate is plotted against the carbon content of these alloys, no significant improvement is shown in the hardenability due to boron

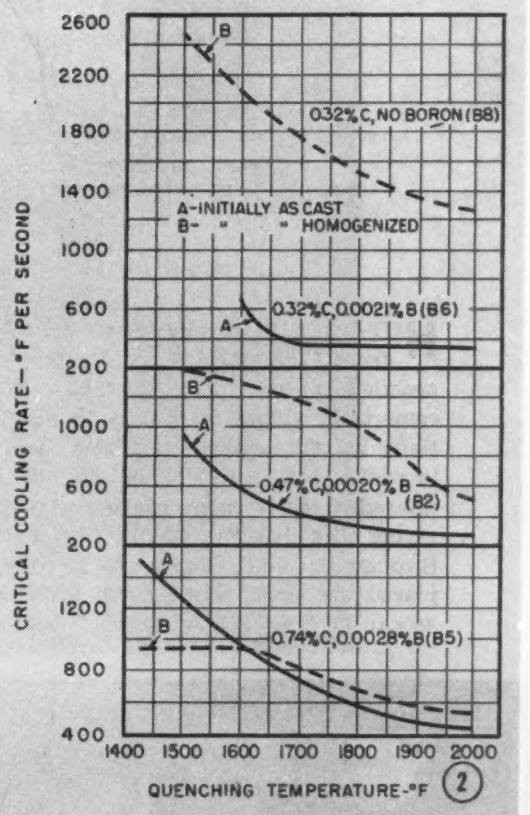


Fig. 2—Relation of critical cooling rate to quenching temperature of some of the iron-carbon alloys initially as cast (curve A) and initially as homogenized (curve B)

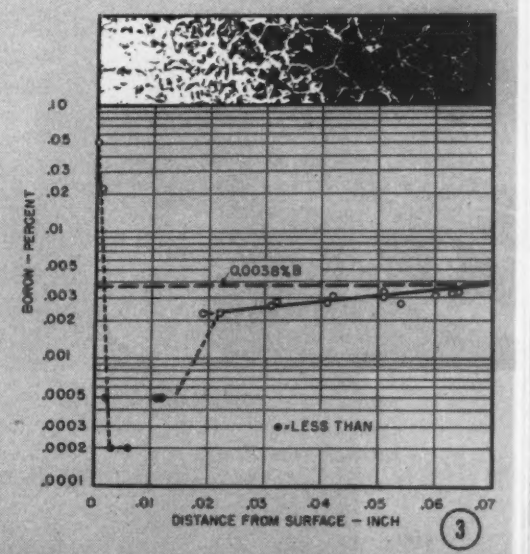


Fig. 3—Distribution of boron in a decarburized layer of a commercial boron-treated steel, as revealed by a photomicrograph superimposed upon a plot of data obtained spectrographically. Specimen was decarburized by heating in a furnace (reducing atmosphere) at 1900° F for 8 hours followed by cooling in mica

FUNDAMENTALS of STEELMAKING

NUMBER 9 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Production Of

HOT and COLD-ROLLED Strip and Sheets

Production of hot-rolled and cold-rolled strip and sheets has undergone rapid technological developments since 1922 and these two commodities, whose conception was separated by 150 years, are now produced on practically identical equipment, varying principally in width and massiveness

By CHARLES L. McGRANAHAN
Assistant General Superintendent,
Pittsburgh Works
Jones & Laughlin Steel Corp.
Pittsburgh

HOT-ROLLING of sheets on a two-high mill dates from 1728 when Major Hanbury introduced this practice at Pontypool, England. This method has come to be known as pack rolling and consists essentially in starting with two sheet bars about 8 inches in width (called a pair) and slightly longer than the desired width of sheet, heating to about 1500°F, then giving the bars a number of passes alternately through the mill. The partially rolled bars are then placed one upon another and given as much rolling as can be done before the pack becomes too cold for further reduction. It is then doubled, reheated and rolled again. If thinner gages are desired, it is again doubled, reheated and rolled as many times as is necessary to produce the proper pack length. Sheet bar commonly weighs from 16 to 80 pounds and by varying the number of bars that are matched and the number of times that the pack is doubled, a wide variety of widths and gages can be produced. This method was introduced into the United States in 1873 at Wellsville, O. and Leechburg, Pa. for the production of tin plate and was followed immediately by sheet rolling at McKeesport, Pa. in 1875.

The pack method, as introduced from Wales in the early seventies, has continued practically unchanged up to the present day. Principal improvements have been in the manner of increasing diameter and length of the rolls and weight of the housings, improving the heating furnaces, substituting the electric overhead traveling crane for the old hand-operated jib-crane and replacing the slow speed direct connected engine, first with high-speed engine and rope drive, and later with electric motor and gear reduction sets. The late nineteen twenties witnessed the introduction of continuous heating furnaces, Fig. 3, mechanical doublers, three-high mills for breaking down the pairs, and

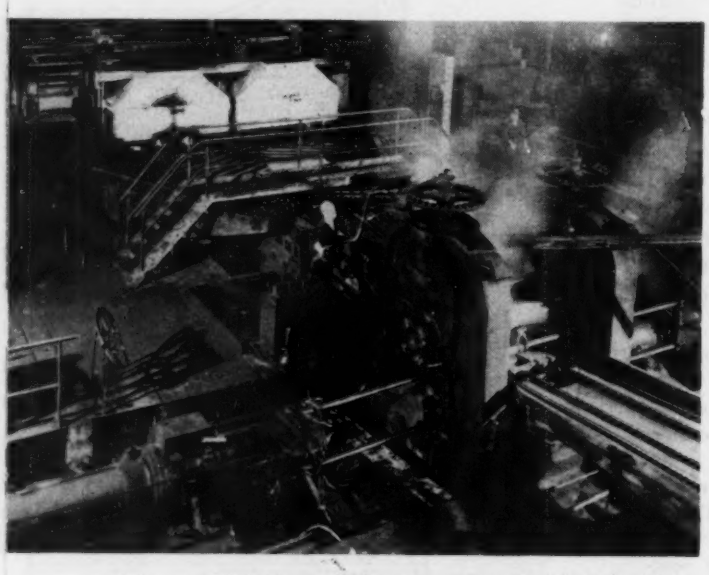
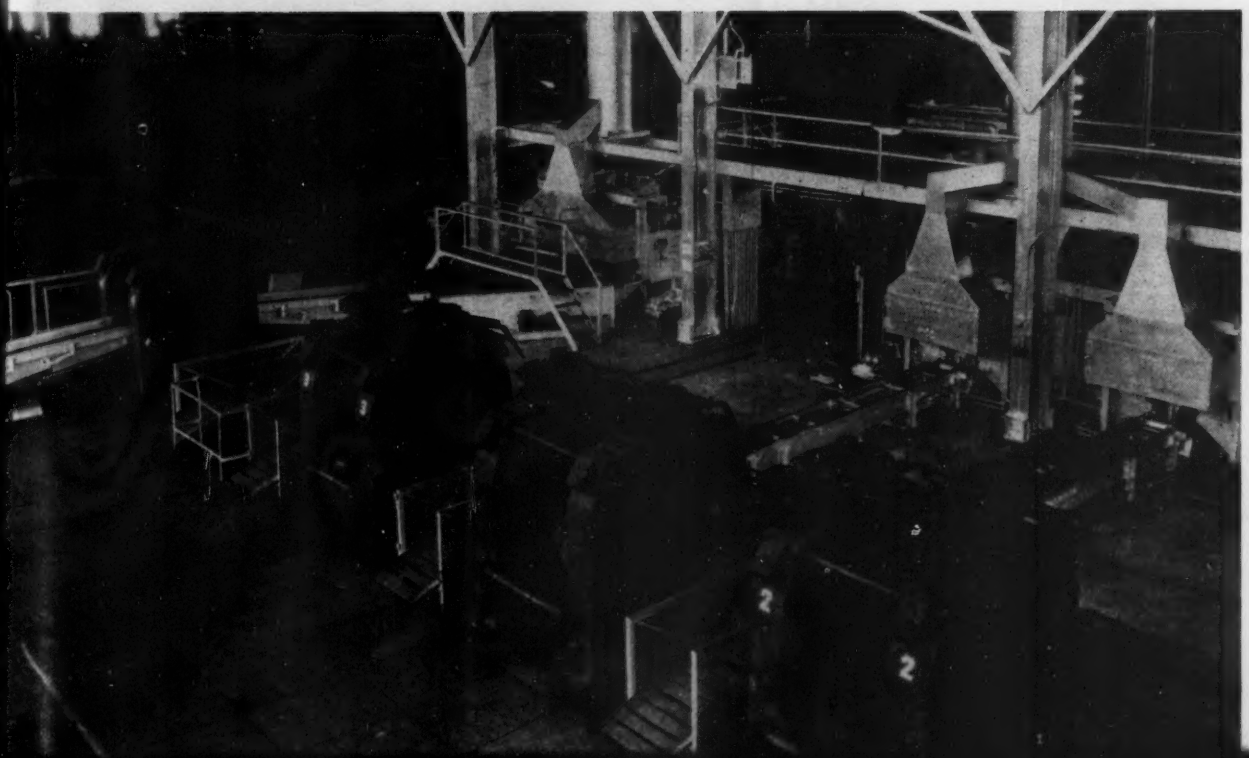


Fig. 1—Finishing stand of a modernized pack mill equipped with double sheet furnace, roller's and catcher's tables and continuous roll polishing device. Wean Engineering photo

Fig. 2 (above right)—Universal roughing stand and approach table to the finishing train. Note pyrometer eye located on overhanging arm above the slab on the table. Mesta Machine photo

Fig. 3 (right)—Two-high pack mills equipped with continuous pair and sheet furnaces as well as roller's and catcher's tables on the finishing stand. Wean Engineering photo



roller and catcher tables, Fig. 1, for the mills. These later developments, while revolutionary in nature, were insufficient to overcome handicaps of high operating costs and inferior qualities when contrasted with broad strip-mill products.

Several attempts were made to produce sheets by a continuous process and each met with varying degrees of success. A continuous process was in operation in Teplitz, Bohemia in 1902, where sheets 50 inches in width, 0.080-inch and heavier in thickness and up to 60 feet in length were rolled. The mill consisted of two 3-high roughing stands in a line, followed by a finishing train made up of five stands of two-high rolls. A slab ingot was roughed down from about 8 to 4 inches in thickness on the first three-high mill, cut into two pieces and reheated. This slab was reduced to 0.280-inch on the second three-high stand and passed through the finishing train without reheating. Considerable gage variation was encountered due to cooling of the sheet in the finishing train. Operation of this mill was abandoned in 1907, probably because of high operating costs and quality of the product.

Attempts were made in Pittsburgh in 1902 at the Monongahela Works of the American Sheet & Tin Plate Co. to eliminate the roughing or breaking down operations by a continuous process. Four continuous sheet-bar heating furnaces were followed by eight stands of two-high mills in tandem. A pair of heated bars were rolled singly through the first six stands, then matched and rolled through the last two stands where they were delivered as a pack of breakdowns.

The author, Charles L. McGranahan is a graduate of Pennsylvania State College, class of 1916, and holds a Bachelor of Science degree in civil engineering. From June until December of the year of his graduation he worked in the valuation department of the Pennsylvania Railroad Co. Following this he was employed in the construction and maintenance departments of the American Sheet & Tin Plate Co. which is today's Carnegie Illinois Steel Corp. from 1916 to 1931. During 1927 he supervised the construction of the United States Steel Corp.'s first continuous strip mill at the Gary Sheet and Tin Mills. In 1931 he was appointed superintendent of the 76-inch hot strip mill at Inland Steel Co. coming five years later to the Pittsburgh Works of the Jones & Laughlin Steel Corp. as assistant general superintendent in charge of the sheet & strip division. He still holds this position today.

Mr. McGranahan is a member and past president of the Association of Iron & Steel Engineers, chairman of the Association of Iron & Steel Engineers' Committee on Rolling Pressures and Power Requirements, and member of the American Iron & Steel Institute and L'Association Luxembourgeoise Des Engenieurs Et Industriels.

After opening or loosening of the two pieces, they were doubled and delivered to a conventional hand mill for heating, rolling, doubling, reheating and finishing into a pack of tin plate.

This mill was shut down in 1905, however, the

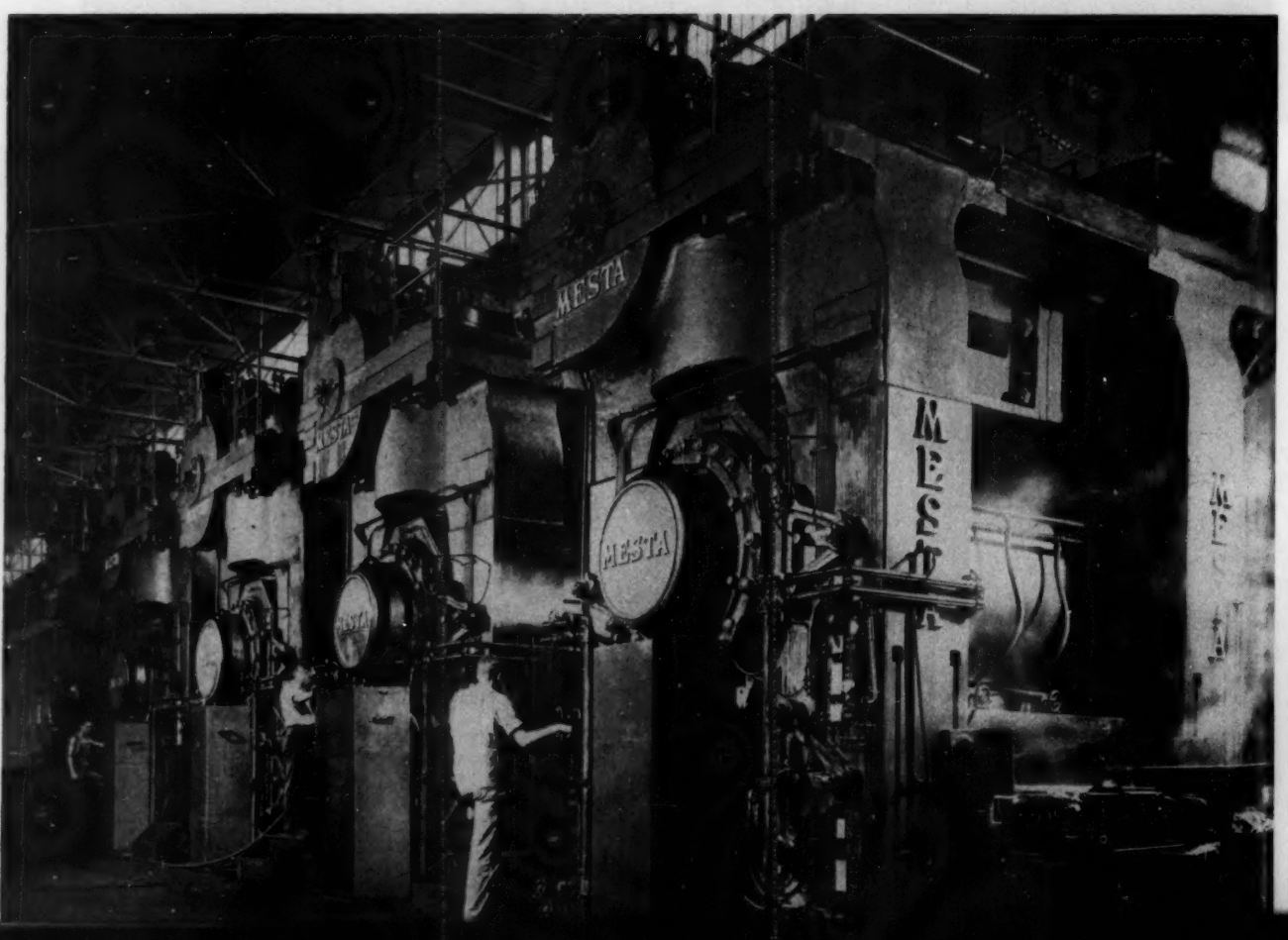
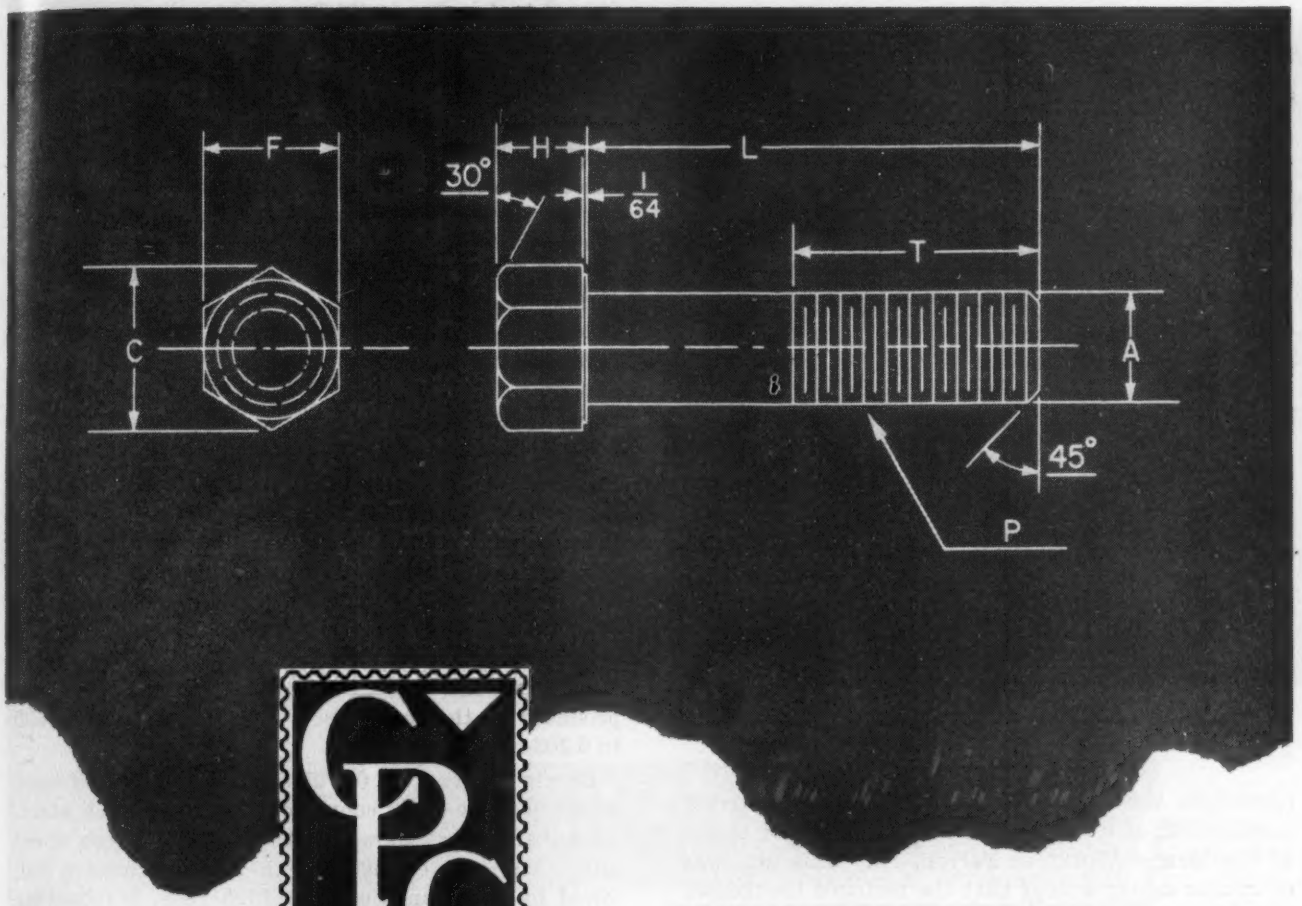


Fig. 4—Modern four-high tandem rolling mill for the production of aluminum strip and sheet. Mesta Machine photo



The Chandler stamp of quality

This quality has been acquired over a period of almost 20 years. It is the result of able management, teamed with skilled personnel operating modern high speed equipment in a completely up-to-date plant. It is the mark of the precise cold wrought basic industrial specialties that

CHANDLER manufactures in many designs, and according to individually exact specifications, for practical purposes.

CHANDLER PRODUCTS CORP.
1491 CHARDON RD. CLEVELAND 17, OHIO

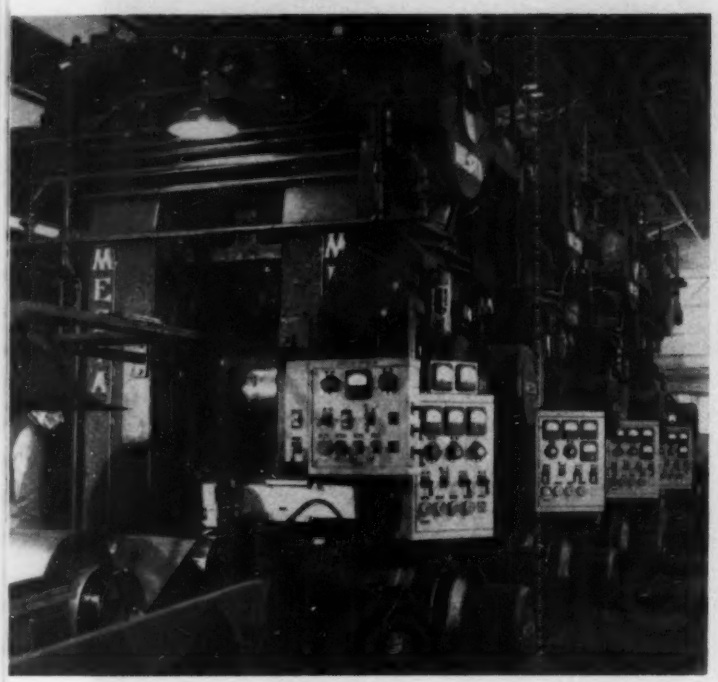


Fig. 5—Recently installed four-high tandem mill for the production of silicon and stainless steels

operations were sufficiently encouraging to warrant construction of a similar mill for production of sheets at the Mercer Works at Farrell, Pa. This mill was of similar design except that the matched breakdown passed through three stands instead of two, the total train consisting of nine stands of two-high rolls. This mill did not produce any economies in operating costs and was dismantled in 1910, the engine and roll housings being used for the construction of a conventional sheet mill.

In 1923, American Rolling Mill Co. placed in successful operation at Ashland, Ky., a continuous mill arranged in tandem for the production of light gage sheets. The product was satisfactory, from both a quality and tonnage standpoint.

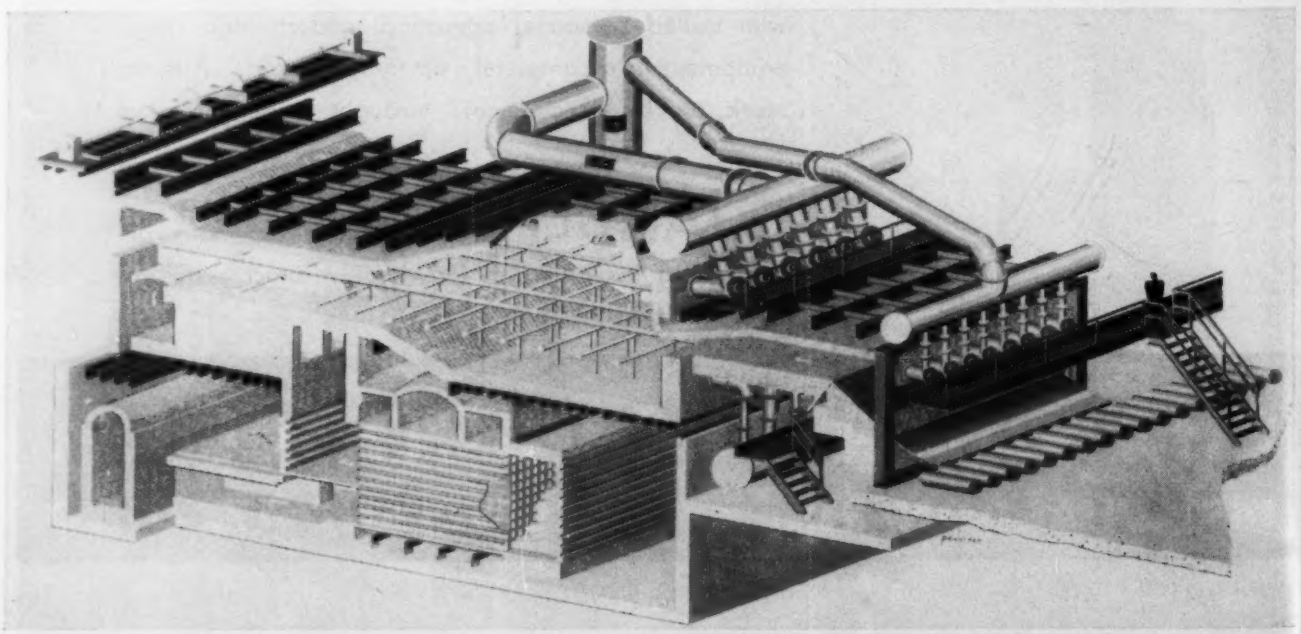
The mill was designed to start with a 10,000-pound ingot which was bloomed down to a slab varying from 3 to 4 inches in thickness, depending upon gage of the finished product. The slab was not allowed to cool but was delivered to a heating furnace which was followed by a bar plate mill of 9 stands, Nos. 3 and 6 being vertical edgers. The slab was first cropped, then a piece slightly wider than the finished sheet was cut, turned 90 degrees and passed through the mill, being delivered as a bar plate about ⅜-inch thick by 30 feet long. While this operation was being carried on, the slab was returned to the holding furnace until the mill was ready for the next cut. The bar plate was of such length that except for light finished gages, it was never in over one stand at a time.

The first continuous unit or bar plate mill was followed by a similar unit consisting of a holding furnace and seven stands of horizontal rolls, the first three stands being two-high and the last four being three-high. The unit was called the rough sheet mill and followed a practice somewhat similar to that of the bar plate-mill except that the length of the cut from the plate was determined by the length of the rough sheet rather than its width, i.e., the cut plate was not turned 90 degrees previous to rolling. Gages produced on the rough sheet mill ranged from 0.0625 to 0.203-inch.

Sheets lighter than 0.0625-inch were produced upon a separate five-stand continuous hot mill which started with cold breakdown packs from the rough sheet mill. The mill consisted of a holding furnace followed by two stands of three-high rolls, a reheating furnace, a second stand of three-high rolls, a reheating furnace, a fourth stand of three-high rolls, a reheating furnace and lastly a fifth stand of three-high rolls. Sheets as light as 22 gage (0.0299-inch) were produced upon this mill and the quality was suitable for the most exacting automotive requirements of that period. It is to be noted that through this period of development, the sheet was finished in a single length and usually was in only one stand of rolls at a time.

Cold rolling of narrow nonferrous sections antici-

Fig. 6—Perspective view of a zone-controlled triple fired slab heating furnace. Rust Engineering print

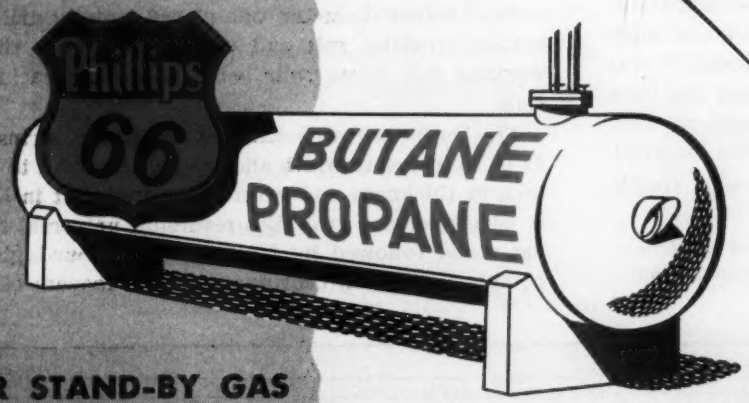


Phillips Designed LP-GAS Plants are:

ECONOMICALLY SOUND

EXTREMELY FLEXIBLE

THOROUGHLY DEPENDABLE



for replacing *all* or *part* of your gas supply on a continuous basis or during emergency or peak load periods.

Write for full information.

FOR STAND-BY GAS OR CONTINUOUS OPERATION

Specialists in **LP-GAS** *Engineering*

PHILLIPS PETROLEUM COMPANY

SALES DEPARTMENT

Philgas Division — **Bartlesville, Oklahoma**

Fully qualified Phillips LP-GAS engineers available without obligation at our District Offices in:

Amarillo, Texas • Atlanta, Georgia • Chicago, Illinois • Denver, Colorado
Des Moines, Iowa • Detroit, Michigan • Indianapolis, Indiana
Jackson, Mississippi • Kansas City, Missouri • Milwaukee, Wisconsin
Minneapolis, Minnesota • New York, New York • Raleigh, North Carolina
St. Louis, Missouri • Tulsa, Oklahoma • Wichita, Kansas

pated the hot rolling of sheets by over 150 years and laid a foundation for the narrow strip industry. The real beginning of the cold rolling of iron and steel as an industry may be said to date from about 1830 with the manufacture and use of steel reeds by weavers in Germany. These reeds were made of high-carbon steel wire, flattened by cold rolling in exactly the same manner as practiced in the flat wire industry today. These reeds, as well as watch and clock springs, probably constituted the principal production of that era.

Invention of the continuous rod mill and the looping mill about 1860 made possible production of rods and narrow flat sections ⅜-inch and wider which were used extensively to bind cases, barrels, buckets and cotton bales. The light flat strip was folded, in much the same way as a skein of wool, in lengths of about 14 feet, when it was known as hoops, or when wound into a circular coil, it was called strip.

In its earlier stages, strip steel was merely a special product of the merchant mill and was rolled along with other thin flat sections such as pipe skelp on an ordinary merchant mill. During the period 1890 to 1900, however, the increasing demand brought it into the specialty class and separate mills were built for its production. This differentiation took place first in the narrower sizes from ⅝ to 3 inches wide and from 16 to 22 gage in thickness which were known as hoops. Production of pipe skelp, 4 inches and wider, was the next to separate from the parent stem and this was followed by thinner gages in the wider widths which became known as band.

When production of strip steel increased sufficiently to bring it into the rank of a specialty and mills were first built for its exclusive production, it was natural that they should be designed along the lines of merchant mills with which their designers were familiar and which had been producing the material.

The mills usually consisted of a continuous roughing train, followed by a strand finishing. In 1907-8, American Steel and Wire built at Cleveland the first wide hot-strip mill to be driven by electric power; it was the first application of the double-duo in this country, at least to the rolling of strip; it was the first application of the tandem finisher as applied to strip rolling. This mill produced strip ranging from 0.049-inch thickness by 2⅛ inches wide to 0.083-inch by 9⅞ inches wide. In 1922-3 Otis Steel Co. of Cleveland constructed the first straight-line tandem mill for production of wide strip in which each pass is made in a separate set of rolls. This mill had a capacity ranging from 0.065-inch thick by 12 inches wide to 0.134-inch thick by 24 inches wide. Construction of this mill marked a milestone in the development of the continuous hot-strip mill as practically all modern strip mills are patterned, with slight modification, after this installation. In the same year a wide strip mill was constructed by West Leechburg Steel Co. which had a maximum width of 20 inches. In 1926 Acme Steel Co. placed in operation a straight continuous-train for the production of strip up to 20 inches in width and in the same year there was placed in operation at Butler, Pa., the forerunner of what is known as the modern four-high broad strip mill.

The principle of the four-high mill was first described by the Swedish engineer, Christopher Polhem in his book published in 1761. It appears that the first installation was made as a cold mill in Stjermsund, Sweden in 1705. Polhem recognized the fact that greater reductions could be taken by small diameter rolls but that considerable variation in thickness resulted due to deflection of the rolls. He solved this problem by reinforcing the small working rolls with rolls of larger diameter, one placed directly under the bottom working roll and one directly over the top working roll, these rolls being called the backing-up rolls.

The Butler mill was designed to produce strips from 12 to 36 inches in width and from 0.183 down to 0.058-inch in thickness and several hundred feet in length. It consisted of a two-high reversing universal roughing stand followed by four stands of four-high rolls equipped with roll bearings and with loopers between

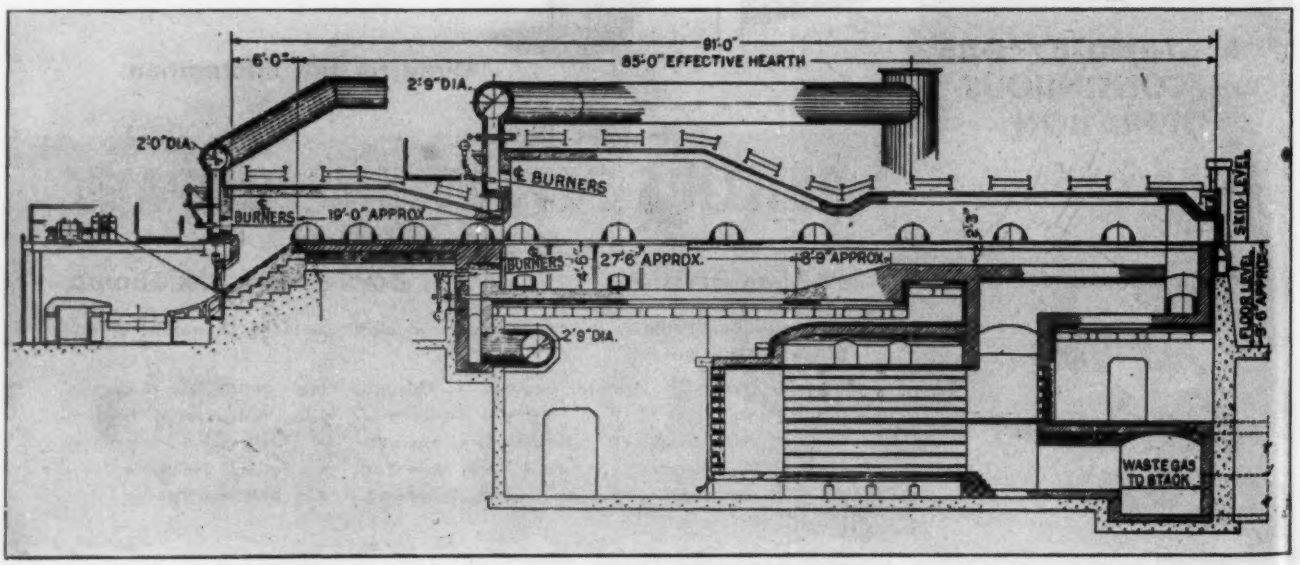


Fig. 7—Vertical cross section through a modern triple fired slab heating furnace. Rust Engineering photo

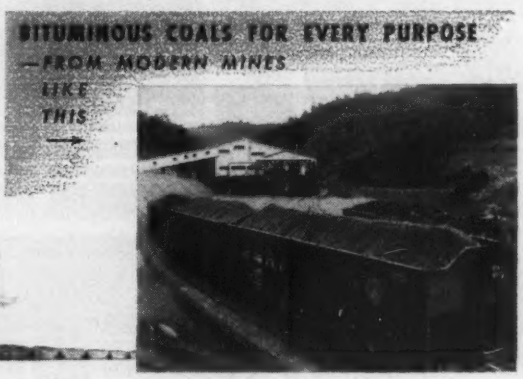
Study fuel costs at long range...

then power *your* plant with B&O Bituminous Coals

Power plant design and operation present few problems to an industrial engineer. But, truly economical performance rests on *added knowledge*—of reserves and availability of fuels—of their cost relationships and combustion characteristics.

In planning the operation of your power plant, study the value of bituminous. Check production cost at the mines. Look at delivered cost of Btu's. Study how carefully the coal you order is sized and cleaned so that waste is avoided. Check availability of continuous supply in normal times and in emergencies. Find out if reserves are extensive enough to assure future supply.

In the coals produced on the Baltimore & Ohio, *you'll find the right answers* to low-cost, long-range supply. Whether you need high-, medium-, or low-volatile coals, they're here in abundance. *Ask our man!* He shall be glad to supply technical help on every phase of coal production, preparation, distribution, and utilization.



BALTIMORE & OHIO RAILROAD

LINKING 13 GREAT STATES WITH THE NATION — B&O

Constantly *doing things*—better!

the stands. Finishing stands were followed by the usual runout table and coilers. It used a slab ranging from 2½ to 4 inches in thickness, 12 to 36 inches in width and about 12 feet long. The heated slab, after leaving a continuous furnace, passed through a scale breaker and then to a roughing mill where it received from five to seven passes in the universal stand, whereby it was reduced to a thickness of ¼ to ½-inch according to the required thickness of the finished strip. On leaving the universal mill it passed directly to the four-high finishing stands receiving a pass in each stand, the length being such that it was in all four stands at one time. From the last stand of the finishing train the piece traveled down a roller table to a coiler where it was coiled up for further processing.

It will be noted that production of sheets on a continuous sheet mill involved the use of a number of roll stands arranged in tandem, the piece progressing from stand to stand, usually in only one stand at a time. In contrast to this operation, the Butler mill produced wide thin sections which were in several stands simultaneously and therefore many times longer. This was made possible by heavier reductions, higher roll speeds and higher rolling temperature. Success of the broad strip mill bridged the gap between the continuous sheet mill and the narrow strip mill and brought forth the most outstanding development in the history of the rolling mill, the four-high continuous hot-strip mill. The product of this mill is classified as plates, hot-rolled strip and hot-rolled sheets, according to gage and width, as indicated by Table I. It will be noted that the width and thickness dimensions constitute the main basis for this classification.

The first step in the manufacture of hot-rolled sheets or hot-rolled strip on a modern continuous hot-strip mill starts with the selection of the slab. In the early stages of this mill's development several installations were made where the slab heating furnaces and roll train were located in line with a blooming or a slabbing mill. The slab, after cropping, passed through the heating furnaces or went direct to the mill and was rolled down to finished gage, thereby effecting considerable fuel economy. This arrangement possesses the disadvantage that delays on either of the rolling units retards operations of the other unit and limits the flexibility of the mill in its ability to produce a wide range of steel grades economically. Except for a limited number, most mills have been designed to start with a cold slab which can be inspected and conditioned previous to reheating and rolling. This method requires more fuel but possesses several distinct advantages, such as reduction in rolling delays, ability to roll small lot orders and reduction in surface rejections in the finishing departments. An important feature of this later arrangement has been the ability to roll slabs which have been produced upon several blooming or slabbing mills, located at considerable distance from the continuous

Fig. 8—Slab yard of a continuous hot-strip mill showing magazine and slab pushers on the entry side of the slab heating furnaces. Slab scarfing dock and gantry crane are located beyond the magazine charger seen in distance. Mesta Machine photo

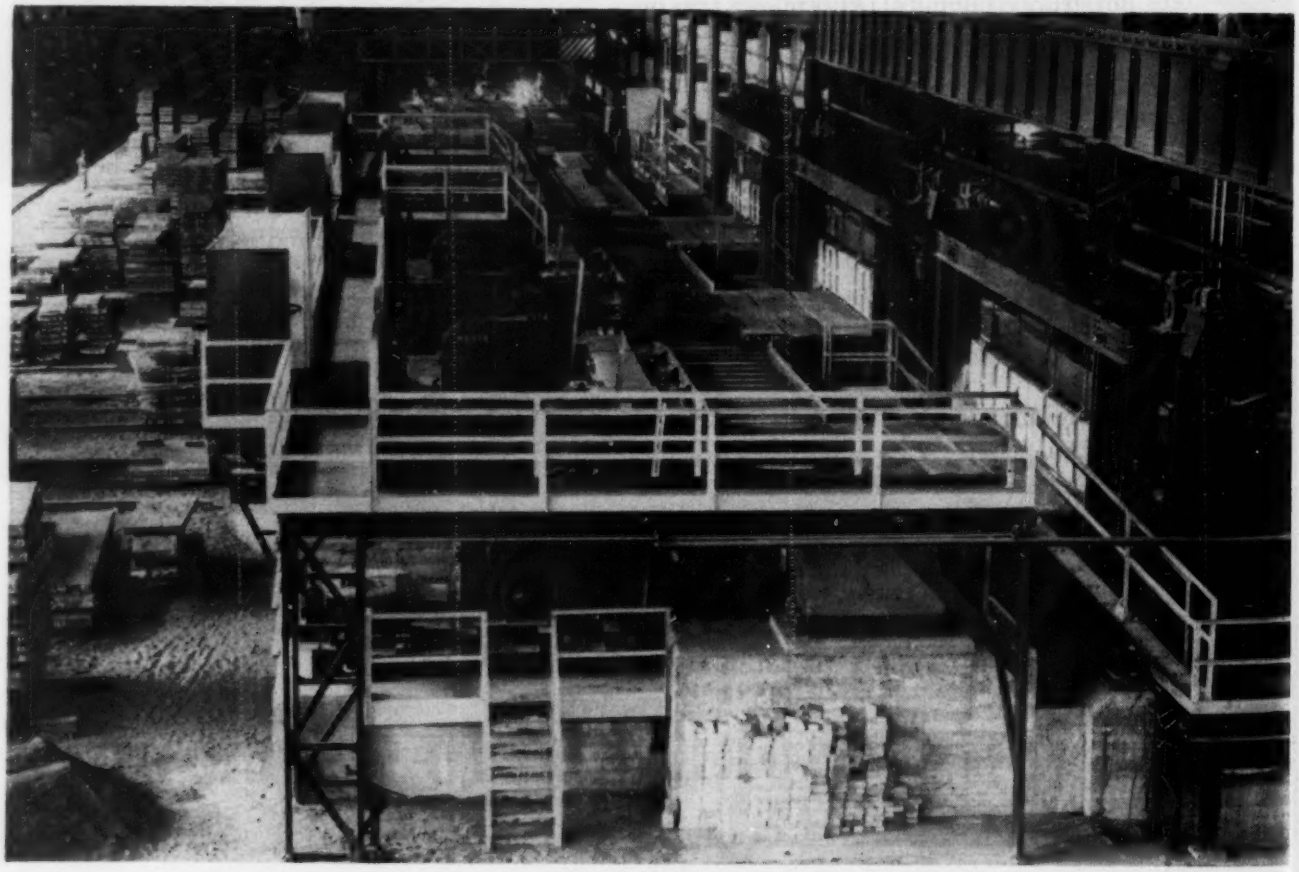


TABLE I
CLASSIFICATION OF HOT ROLLED PLATES, BARS, STRIP AND SHEETS

Widths, Inches	Thicknesses, Inches								
	0.2300 and Thicker	0.2299 to 0.2031	0.2030 to 0.1800	0.1799 to 0.0568	0.0567 to 0.0449	0.0448 to 0.0344	0.0343 to 0.0255	0.0254 to 0.0142	0.0141 and Thinner
To 3½ incl.	Bar	Bar	Strip	Strip	Strip	Strip	Strip H.R.A.	Sheet H.R.A.	Sheet H.R.A.
Over 3½ to 6 incl.	Bar	Bar	Strip	Strip	Strip H.R.	Strip H.R.A.	Sheet H.R.A.	Sheet H.R.A.	Sheet H.R.A.
Over 6 to 12 incl.	Plate	Strip H.R.	Strip H.R.	Strip H.R.	Sheet H.R.	Sheet H.R.A.	Sheet H.R.A.	Sheet H.R.A.	Sheet
Over 12 to 32 incl.	Plate	Sheet H.R.	Sheet H.R.	Sheet H.R.	Sheet H.R.	Sheet H.R.A.	Sheet H.R.A.	Sheet H.R.A.	H.R.A.
Over 32 to 48 incl.	Plate	Sheet	Sheet	Sheet H.R.	Sheet H.R.	Sheet H.R.A.	Sheet H.R.A.	Sheet H.R.A.	Sheet H.R.A.
Over 48	Plate	Plate	Plate	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet

hot-strip mill. It has become an almost universal practice to condition or remove the surface defects on the slab at the slab yard serving the heating furnaces of the strip mill. The slabs are spread out on skids by means of a gantry crane, Fig. 8, equipped with a magnet on a stiff leg similar to a soaking pit crane mast. Defects are marked with chalk and then removed by use of an oxyacetylene hand torch, an operation termed scarfing. The gantry crane quickly turns the slab over for inspection and removal of defects on the bottom side, then repiles the slab for stocking behind the heating furnaces.

Hot-strip mills were originally equipped with two or three recuperative continuous pusher type of heating furnaces, however, it has now become almost standard practice to provide four of the zone-controlled, triple fired type.

Mills, ranging in width from 79 to 98 inches, are provided with furnaces about 20 x 80 feet long inside width and so designed that they will take two rows of slabs 6 x 50 x 106 inches or one row 6 x 50 x 212 inches. The furnaces are of the end-charged, end-discharged type and consist of a main heating zone with burners located above and below the steel. Slabs are pushed through this portion of the furnace on water cooled skids, usually two in number for each row of steel, supported on brick piers at the charging end and on water-cooled cross skids in the heating zone. The steel is brought up to approximate rolling temperature in this first heating chamber and on continued pushing, enters a soaking chamber, which is separated from the primary heating chamber by a suspended, low-hanging roof and which is heated by a separate set of burners located above the slabs. The soaking zone is provided with a solid refractory hearth which in some instances may contain steel billets or hot skids which reduce hearth abrasion. Function of this chamber is to "soak-out" the water-cooled skid marks from the main heating zone and to bring the slab to a uniform rolling temperature as it advances to a gravity discharge at the furnace end.

Slab heating furnaces operate equally well on natural gas, coke oven gas, coal tar, or fuel oil and in some cases on producer gas. There is a continued rise in temperature as the slab advances through the furnace and the oxygen in the fuel mixture is so regulated as to produce a uniform heavy scale which is easily removed and improves slab surface by cleaning up small defects not discernible when the slab was scarfed. Modern furnaces operate at from 60 to 100 net tons per hour and one slab consumes about 2 hours time in transit through the furnace.

TABLE II
CLASSIFICATION OF COLD ROLLED BARS, STRIP, SHEET, AND PLATES

Widths, Inches	Thicknesses, Inches		
	0.2500 and Thicker	0.2499 to 0.0142	0.141 and Thinner
To 12 incl.	Bar	Strip‡	Strip‡
Over 12 to 23-15/16	Strip*	Strip*	Strip*
Over 12 to 23-15/16	Sheet†	Sheet†	Black Plate†
Over 24 to 32	Sheet	Sheet	Black Plate
Over 32	Sheet	Sheet	Sheet

* When a particular temper as defined in A.S.T. specification A 109, or a special edge, or special finish is specified.
† When no special temper, edge or finish is specified.
‡ When the width is greater than the thickness with a maximum width of 0.05 sq. in., and the material has rolled or prepared edges, it is classified as flat wire.

Production of strip up to 12 inches in width and of narrow sheets up to 24 inches in width is still largely produced on two-high mills. While early mills resembled a merchant mill, i.e., consisting of a tandem roughing train and a looping or cross-country finishing train, later design utilized a straight-line arrangement of tandem roughing and tandem finishing train followed by a single or double hot-bed with shears and one or more coilers. Some narrow mills have been modernized by replacing the two-high finishing stands with four-high stands of recent design. The method of operation of a narrow hot-strip mill is so similar to that of a wide strip mill that our description will be limited to the latter type for the present.

Roll trains of the modern continuous hot-strip mill generally consist of a scale breaker followed by four roughing stands, then a delay table for controlling finishing temperature as well as raising a light scale on the steel's surface, a second scale breaker for removing this scale, and a finishing train of six four-high stands. A rotary flying shear is usually located on the entry side of the second scale breaker and on the exit side of the last finishing stand. A runout table extends from the finishing train to the coilers, a distance of approximately 360 feet and continues on a distance of about 250 feet from the coilers to a sheet piler. Several broad strip mills are equipped with hot beds between the mill and the coilers, either of the single or double type. The hot bed is followed by two or three lines of slow moving tables, transfers between the various table lines, a kick-off and cradles for unfinished sections, a rotary side-trimmer, a leveler, an end-shear and a final kick-off and cradles for finished sections, the total length of such tables amounting up to 2500 feet.

(To be continued)

Special Phosphate Coating Treatment

. . . ups output of cold drawn tubing

ENGINEERS and operating supervisors of the Gambrinus, O. plant of Timken Roller Bearing Co. report that use of a special phosphate-coating treatment for steel tube stock to be cold-drawn aids it to retain lubricant longer; permits greater reduction per pass and faster drawing, and results in less damage to tubing and dies.

In some instances this phosphate compound has made it possible to give steel tubing a double pass without the intermediate annealing formerly necessary. Timken men pioneered the use of the treatment, working in collaboration with chemical engineers of Calgon Inc., Pittsburgh manufacturer of the phosphate material.

Unlike other phosphate materials first used for this predrawing treatment, Banox requires no heat for application. Bundles of tubing are immersed for 2 minutes in an unheated 1¼ per cent solution of this phosphate compound in the pickling department, before "doping" with cold-draw lubricant.

Used As Rust Retardent—This is the material's first known use in tubing manufacture, according to Calgon's chemists, although it has been successfully employed as a lubricant aid in wire-drawing at the Aliquippa, Pa. works of Jones & Laughlin Steel Corp., as well as at several other wire mills (See STEEL, Nov. 8, 1948, p. 102). Also, it is being employed as a rust-retardent and paint-bonding coating by several manufacturers of fabricated steel products, such as outdoor furniture, kitchen ranges, washers and ironers, automotive equipment and similar items.

At Timken's Gambrinus plant, where this phosphate treatment for cold-drawing tube stock was pioneered, round billets are pierced and rolled, then hot-pointed on a hydraulic squeeze pointer; next they may be annealed, depending on specifications, then go to the pickle house. There the tubing stock is pickled by conventional immersion methods, in reel-type or still tanks containing 15 per cent sulphuric acid solution. A hot rinse (150° F) follows, and then the material is immersed for 2 minutes in an unheated 1¼ per cent solution of the compound. It finally goes into another rinse prior to "doping" with a special cold-drawing lubricant developed by Timken lubrication engineers.

The phosphate solution is easily maintained at proper strength by the simple addition of small amounts to the tank as required. It does not precipitate a hard sludge with continued use, so that tank cleaning entails only emptying and flushing with water.

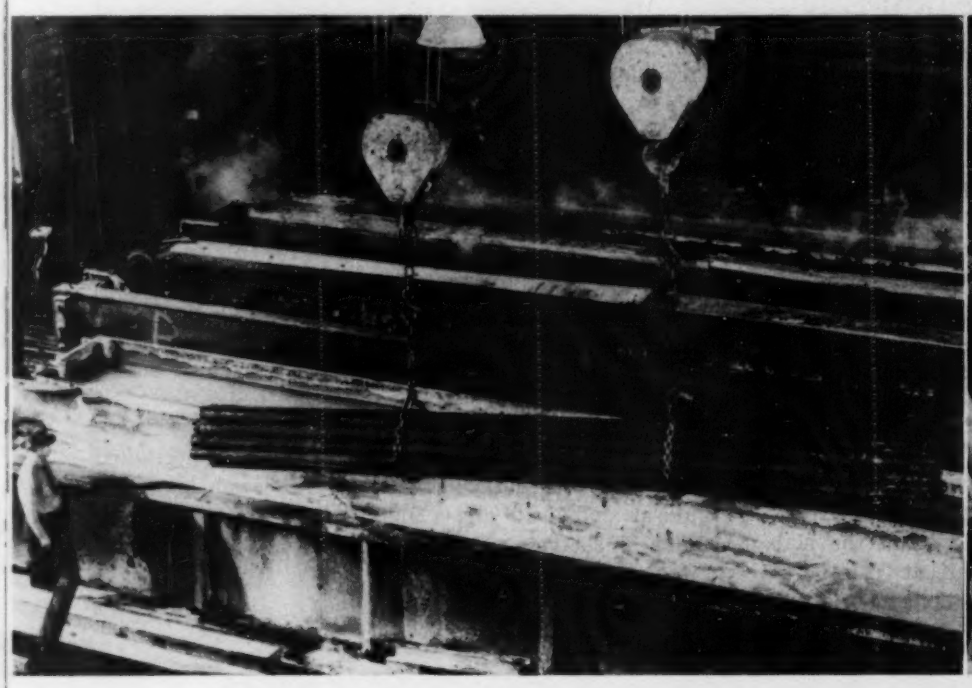
Chemists Discount Theory—Opinion as to why this phosphate material is effective as a lubricant-aid, or as a lubricant in itself, is divided. One theory advanced—that the film it forms is absorbent, and therefore retaining lubricant longer than it would normally adhere to tubing during cold-drawing—is discounted by Calgon chemists on grounds that the film is too thin to be capable of such action.

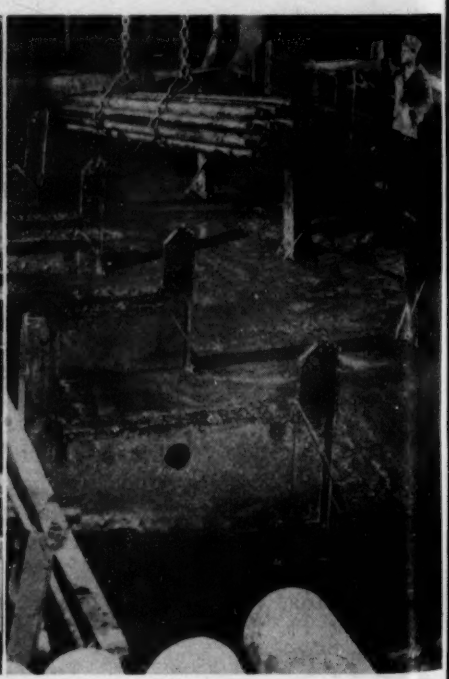
They explain that the compound "plates out" on steel surfaces as an amorphous phosphate film, microscopically thin—perhaps 15 millionths-inch—yet plastic and continuous, and closely following contours of the metal surface. It is deposited spontaneously from an unheated solution without visible attack on the metal surface, thus differing radically from the older coatings which were used as an aid in the cold forming of steel.

In its conventional use as a room-temperature rustproofing and paint-bonding material it is capable of enabling paint to withstand bending stresses and impact with less likelihood of damage.

Fig. 1 (left)—Bundle of tubing stock emerges from its 2-minute bath in the unheated phosphate coating solution

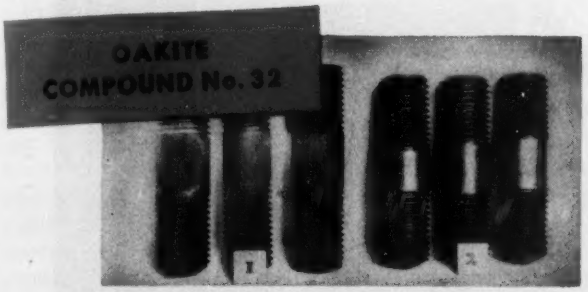
Fig. 2 (right)—Lift of tubing stock descends into tank for "doping" with Timken's special cold-drawing lubricant





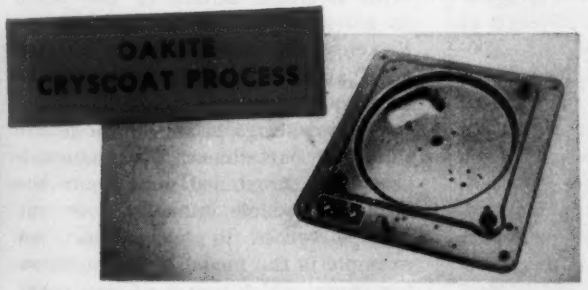
Corrosion is electrolytic action which causes ferrous metals to break down into oxides known as rust. The cost to you and industry? Almost six billion dollars a year. But with the Oakite anti-rust program you can . . .

Cut your rust costs 3 ways



Rust-covered bolts, at left, shown clean and derusted at right, after Oakite derusting treatment.

Forged and machined stock, spray-coated for in-storage protection against rust.



Record-changer bases are CrysCoated before painting for anti-rust protection.

OAKITE methods and materials for combating rust are sure in action, low in cost. Used as directed, Oakite Compound No. 32, an inhibited acidic material, removes rust and scale without brushing or scraping . . . without harming metal. Merely immerse parts, then neutralize and rinse—rust is gone.

To prevent indoor rust on work in process, parts or assemblies in storage or in transit, use Oakite Special Protective Oil. Leaves a semi-permanent, thin oil film which provides adequate protection against corrosion. Applied by dip tank, spray or brush, Oakite Special Protective Oil displaces moisture on metal surfaces; drains and dries quickly. Easy to remove. Economical because thin film covers large areas . . . has high dilution ratio.

Ferrous parts ready for painting may be rust-protected by means of the Oakite CrysCoat Process. Applied in machine or tank, this widely used pre-paint treatment not only retards under-coat corrosion, but cleans and phosphatizes metal for tight paint grippage. Also localizes corrosion if paint is scratched.

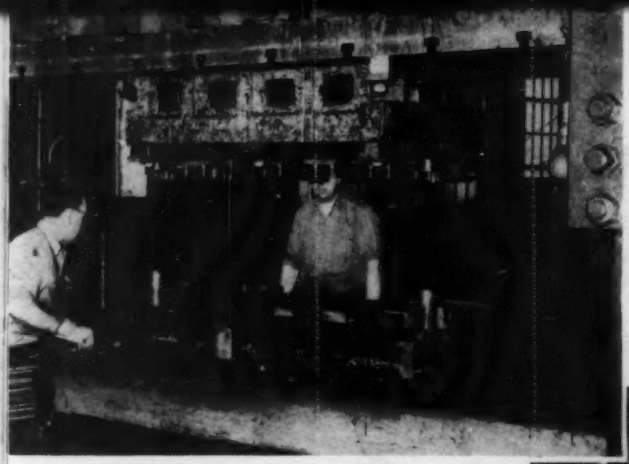
Write Today for detailed facts about the Oakite 3-way anti-rust program. No obligation.

OAKITE PRODUCTS, INC., 30H Thames St., NEW YORK 6, N. Y.
Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE

OAKITE 1909 1949 40th ANNIVERSARY YEAR

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

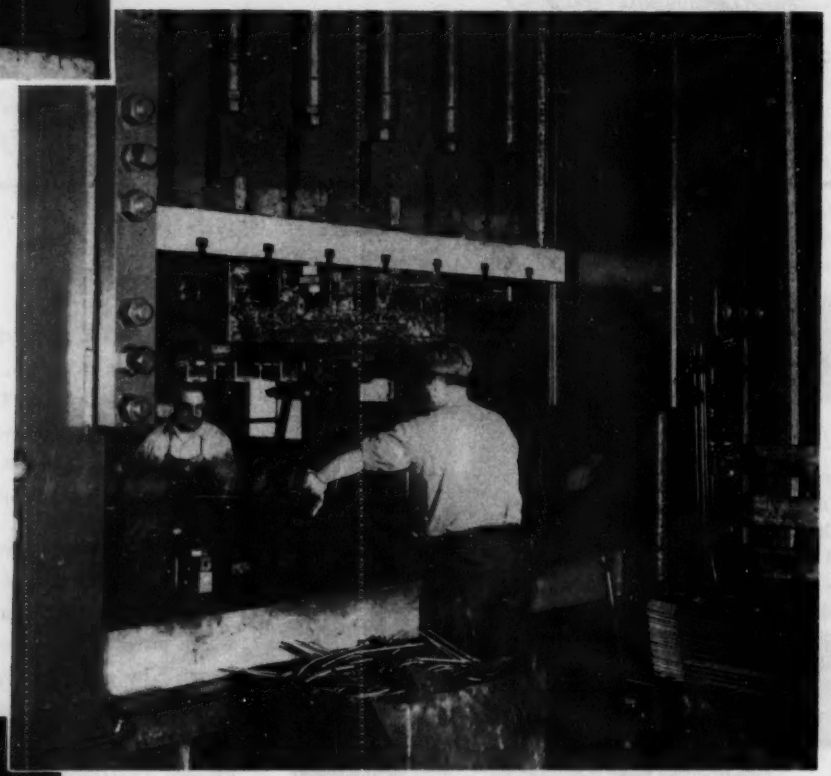


When castings became hard to obtain and curtailment of production schedules threatened an already "behind-the-schedule" industry, this organization's engineers turned to press fabrication for many of the parts needed in the assembly of their products

Ingenuity in Press Operation

. . . affords fabrication savings

By JAMES M. HERENDEEN
Chief Industrial Engineer
Cleveland Division
Oliver Corp.
Cleveland



Typical operation on the Verson 2000-ton press—stamping out right and left halves for a track frame housing. Shown are views of the entry of stock and delivery of finished stamping on other side of press

POWER and weight, the ability of great 20-ton machines to push and pull tremendous loads encountered in logging, roadbuilding, large-scale farming, and other operations in which they are indispensable, are the prime characteristics of the track-type tractor industry and because these tractors represent expensive capital equipment to their owners and users, the manufacturers are engaged in continuous effort to provide their customers with better engineered and machined products offering the most power and performance per dollar invested.

It takes power to build power; weight to fabricate weight; many hours of thinking and planning must be used in engineering, but to attain and produce such a product, powerful and highly precisioned machines must be obtained and used to their full extent.

The latest addition to the growing inventory of such machinery at our Cleveland plant is a Verson 2000-ton series press. This unit delivers, near the bottom of the stroke, a total of 4 million pounds of pressure. In this type of machine, which has a die area of 6 foot 3 inches x 11 foot, many different parts are blanked, pierced and formed. One such part is the main frame side members, which are made of ⅞-inch thick steel plate, formed in the shape of a Z some 12 inches high by 10 feet long, and weighing 548 pounds. This operation is performed in two strokes of the press, which is equal to the two forms.

Another interesting operation is the track frame housing, which is made up of two pieces, namely a left and a right.

Both of these two pieces are blanked and inserted into a very large die. With a single stroke of the press 85 holes are pierced at one time in ⅜-inch steel, holes varying in size from about ⅜ to 2¼ inches in diameter.

When castings became hard to obtain and curtailment of production schedules threatened an already behind-the-schedule industry, our engineers turned to fabrication. An example is the model D transmission top cover, which was for many years a casting—now it is a piece of steel 5/16 x 24 x 30 inches blanked and 55 holes pierced by one stroke of the press. At the same time and from the same piece of steel, the inspection plate covers are made thus utilizing every inch of steel in the blank.

Another such operation is the rear drive wheel, which is used for driving the track on each side. These parts are made from steel and consist of a center piece and two ½-inch steel

rings which have 27 teeth. With a single stroke of the press, these teeth are all notched out. The same operation is performed on the center piece, placing the large hole and 10 stud holes. All pieces being assembled, they then become rear drive wheels.

To manufacture a better product competitively a new method of producing bucket seats for the farm tractor was worked out. This operation is done by placing three large dies in the press; a blanking die, piercing die and forming die, and is handled by four operators each moving the pieces through their various stages. Thus with each stroke of the ram, a complete seat is made which, of course, is contrary to the old method requiring three operator setups and operations.

Presses, by far, are not the only new machines being placed into line production. There are the ever constantly needed boring mills to produce combination transmission and differential cases, to bore holes to 0.008-inch with a possible 0.002-inch high limit. This, of course, takes highly accurate machines to produce such a case weighing up to 2180 pounds for the largest tractor. The track shoe links are bored to close tolerances on a boring mill of the very latest design which runs automatically. These same links are surface broached at the rate of 500 pieces per hour by a single operator, where formerly it required two men on a milling machine to produce 90 pieces per hour.

Induction hardening has, in a large part, replaced the older method of hardening track shoe links and has proved far superior. In the not too distant future, we expect to have an even better way to produce this ever important link which goes to make up the track on which these huge machines crawl.

Spline hobbing machines also play an important part in the production of tractors. As you can well imagine, a shaft spline that turns the rear drive wheels, which in turn powers the track, has to be accurate and tough.

Incidentally, all of our machines are not production machines as we also make nearly all of our own dies, jigs and fixtures. This also requires highly precisioned tool room equipment.

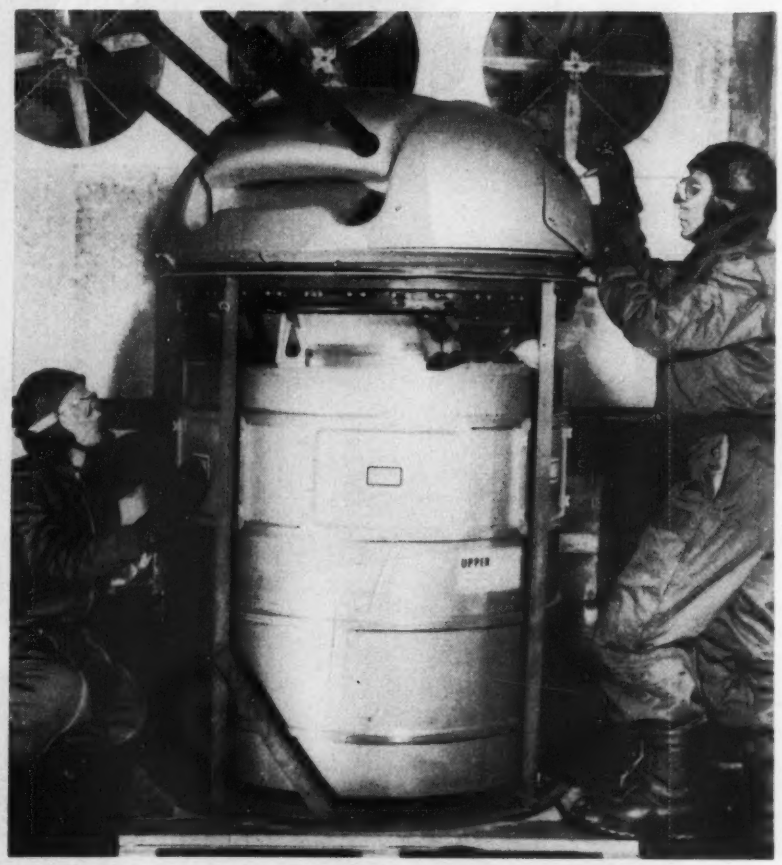
Such demanding operations as described above can only be performed through the type of power built into this huge press, which stands 29 feet above floor level, erected on a base 12 feet in height below the floor, 24 inches thick, 15 feet long, and with 10 foot sides in the shape of a U. In the U are placed the tanks, 24 inches in diameter by 6 foot high, which house oil for the pneumatic cushions and two tanks of the same size for air, which control the counter-balancing units. Operation through limit switches, electrical controls, and piping is almost fully automatic. Three-hundred and sixty-thousand pounds of concrete and over 152 tons of steel were used in making this foundation to support the press weighing 250 tons, delivering 2000 tons pressure, effecting an over-all operating mechanism of 41 feet below and above the floor.

Bed area of the press is about as large as the kitchen of a modern home. Welded steel construction does away with the old-type crankshaft, which has been a source of trouble from time to time and has now been replaced by eccentrics welded to the steel main gears. This gives the same motion to the ram as the old crankshaft method. The fly wheel on the side and all moving parts are enclosed in the top of the machine, where noise is virtually eliminated with gears that are accurately cut and run in an oil bath.

This press exemplifies the entire tractor industry's drive to produce more powerful and better tractors. Machines of this type allow the industry to make in its own plants parts formerly made by outside suppliers.

—o—

Experiments on belt-drive fundamentals is the subject of bulletin number 135, published by Engineering Experiment Station of Ohio State University, Columbus. Written by C. A. Norman, professor of mechanical engineering, the 36-page bulletin contains a summary of findings, details of the various tests performed, photographs, graphs, and drawings of the equipment used and the results obtained.



ICE BOX TEST: Turrets to be installed as part of the defensive armament systems of 400 mph Air Force B-50 bombers are shown being subjected to temperatures as low as −65° F in a "cold box" in General Electric's Schenectady, N. Y., plant. Besides tests at this temperature, the normal at about 40,000 foot altitudes, turrets are being subjected to severe strain, simulating high wind velocities and shock, are given a test to determine the amount of electric power needed to drive the unit and then test fired on the company's firing range

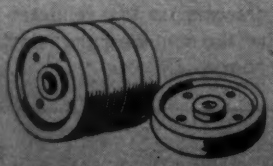
STANDARD Forging Practice

MANY of the most spectacular improvements in modern equipment have come from improvements in the strength and service properties of vital parts . . . and Standard forgings have played an important role in these advances. Every phase of the heating and mechanical working of the ingot into the final forging has been brought to a high degree of perfection at Standard, and a series of progressive checks and tests continuously safeguard forging quality. The connecting rods illustrated are just one of a number of groups of forged products regularly produced to meet the expanding needs of modern industry.

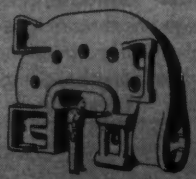
NOTICE: DESIGN AND PURCHASING DEPARTMENTS

Standard is equipped to supply you with locomotive, marine, or ordnance forgings, shafts, rolls, or any other forging of a weight not exceeding 25 tons, which can be made under a press or hammer. Shop equipment includes 14 steam hammers with capacities ranging from 3,500 to 12,000 pounds, and six steam hydraulic presses with capacities of from 600 to 2,500 tons. We will appreciate an opportunity to quote on your requirements.

STANDARDIZE ON STANDARD FOR



WHEEL MILL PRODUCTS

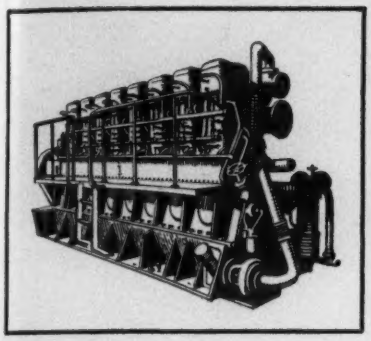


STEEL CASTINGS

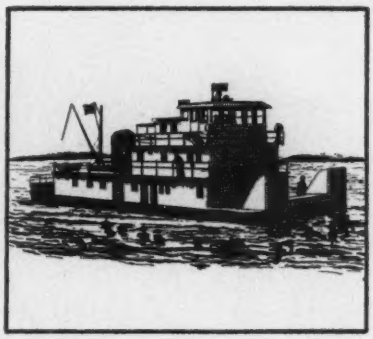
WELDLESS RINGS

FORGINGS

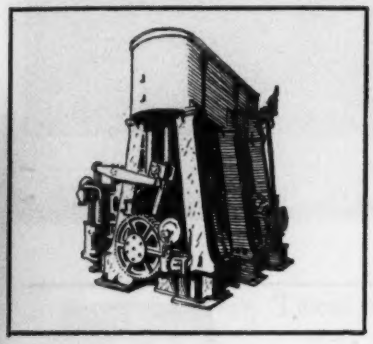
tic Pays Off in Performance



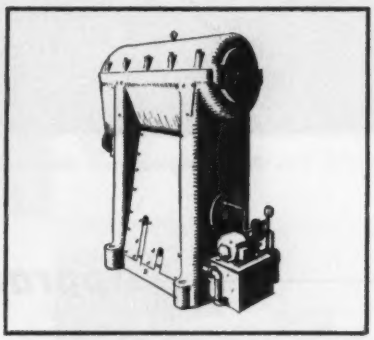
The continuing increase in the size and power of diesel engines has demanded a corresponding increase in the strength of connecting rods and similar parts. Standard's controlled forging practice brings out the best in the metal, equips the rods to meet their new responsibilities.



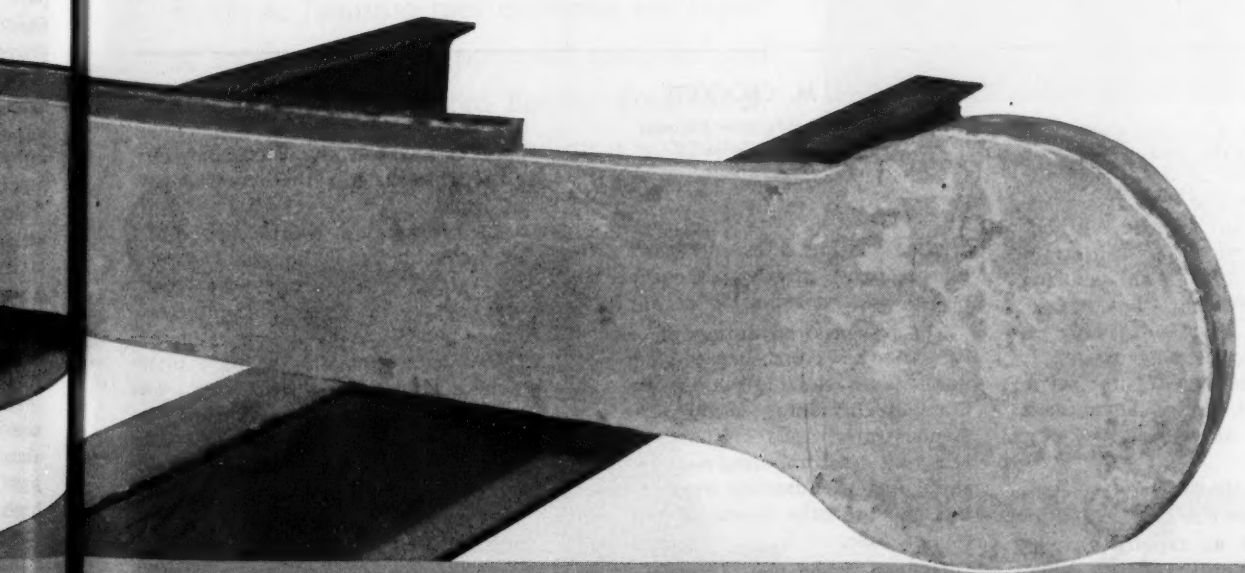
River boats are another application where the excellent physical properties of Standard forgings add an extra margin of performance to equipment.



The superior service properties that Standard forging and heat treating practice puts into pistons, shafts and similar parts for reciprocating and rotary pumps, adds a valuable factor of safety in the withstanding of sudden shocks, sustained full loads, and similar severe conditions.



Any reciprocating equipment that is subjected to unusual punishment gains in dependability through the use of Standard forgings. Care in manufacture pays off in better performance.



The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U.S.A. Offices: Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington.

BLW THE BALDWIN GROUP

BALDWIN

STANDARD STEEL WORKS DIVISION

Injecting oxygen into bath of electric furnace steel

Appraisal of

Oxygen in Electric Furnace Practice

Experiments indicate there is a definite rate of oxygen injection per ton of charge, above which efficiency of the oxidizing reactions lessens. At present the injection rate for greatest efficiency appears to be about 100 cubic feet per minute per ton

By J. M. CROCKETT

Assistant Metallurgical Engineer
Air Reduction Sales Co.
New York

GASEOUS oxygen has become a common material in steel refining. Adoption of oxygen has been especially rapid in electric furnace practice where the substitution of oxygen for iron ore as an oxidizing agent has particular advantages. Purpose of this discussion is to review the practice of using oxygen as a direct oxidizing agent in electric furnaces, and to discuss advantages found in its use as well as problems involved.

In order to gain the full benefit afforded by oxygen it is desirable to oxidize the bath as rapidly as possible and, in general, rate of oxidation will increase with rate of oxygen injection. In practice, as discussed below, there are factors which limit the injection rate.

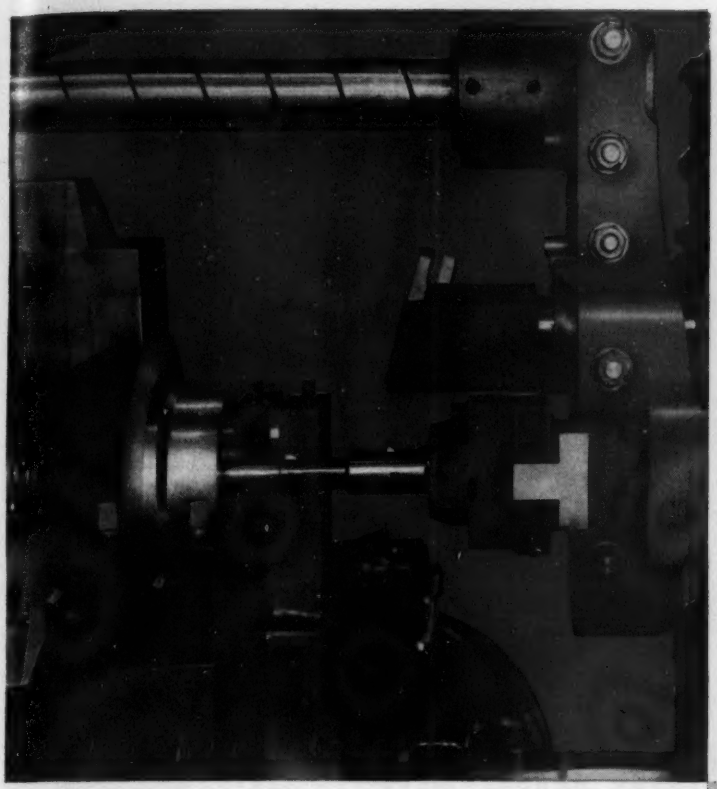
Principal benefits from the use of oxygen in electric furnaces are: Increased melting rates, increased bath temperatures, more rapid carbon removal, and conservation of alloys.

The potential advantage of oxygen use will vary from shop to shop, and methods of realizing maximum benefits will also differ. Experience has demonstrated the importance of studying factors involved in each shop, and of adapting oxygen practice to meet the needs of the particular case.

Oxygen Efficiency—Oxygen efficiency is commonly expressed as the quantity necessary to remove a given amount of carbon compared to the theoretical amount required. This ratio is expressed as a percentage of the theoretical amount. Open-hearth data established the fact that efficiency increased with increased rate of injection.[1]

In the original work with direct oxidation it was thought that the rate of oxygen injection was limited only by the damage to roof refractories which would result from extreme bath agitation at high injection rates. The conclusion was reached that in medium and low carbon ranges oxygen would react with the bath as rapidly as it could be injected, and that there was no upper limit to injection rates when considering chemical efficiency alone.

The original work had been done on large furnaces which absorbed all the oxygen which could be furnished with the facilities at hand. Later experiments on small furnaces indicated that there is a definite rate of oxygen injection per ton of charge,

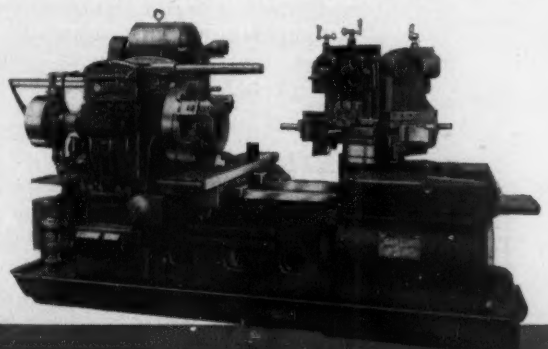


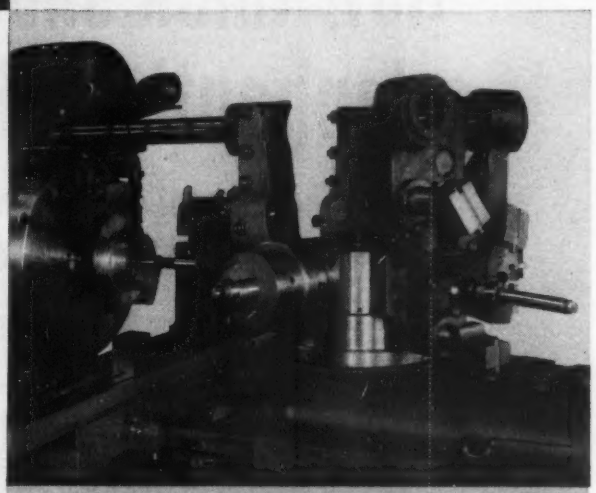
RIGIDITY typical of *tooling by P&J*

Speed in the roughing and fine finishing of the spherical seat of this casing is based on the extremely rigid setup of the radial ground form tools. The 6-DRE's lowest feed of .007", with a speed of 55 fpm, is used to obtain the final smoothness and accuracy. Material: Bellmaloy, Brinell 179 to 207 Tooling: Tungsten Carbide.

Twenty-seven operations on a differential case in 9.6 minutes, floor-to-floor, with the P&J 6-DRE. Profitable? Of course it is . . . with P&J Automatics tooled by P&J!

Potter & Johnston tool engineers are expert at tooling up these powerful machines and coming up with record floor-to-floor times. Get a P&J estimate by sending a sample of your work . . . there's no obligation.





SEQUENCE OF OPERATIONS FOR FULL AUTOMATIC CYCLE AS TOOLED BY P&J

1st TF— Rough bore 2 dias. Face seat. Rough form spherical seat. Bore dia. Rough turn 2 dias. Rough face flange. Face end.

2nd TF— Finish above operations. Chamfer.

3rd TF— Finish face seat. Finish face end.

4th TF— Ream. Size bore. Size turn 7.625" dia.

5th TF— Finish form spherical seat. Finish face seat. Face end.

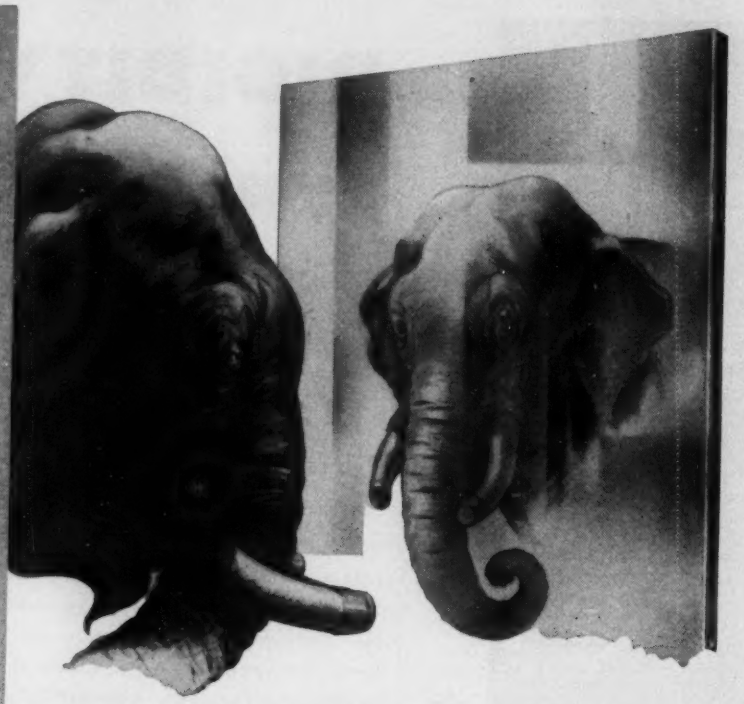
6-DRE AUTOMATIC

Potter & Johnston Company

Pawtucket, R. I.

subsidiary of Pratt & Whitney Division Niles-Bement-Pond Company

P&J



How thick should an elephant's hide be?

Thick enough to withstand the attacks of its enemies

● That's also true of your stainless equipment . . . Why pay for more stainless metal than you need? . . . By using IngAclad you greatly reduce the material cost, yet have perfect stainless protection on the exposed surface . . . IngAclad consists of a 20% cladding of finest stainless steel bonded by the Ingersoll Process to a backing of carbon steel.

If you are considering modernizing your plant with stainless equipment, be sure to investigate IngAclad . . . the only Stainless-Clad material with a 16-year record of satisfactory service in continuous use.

Write for Special IngAclad Folder and Manual of Fabricating and Welding Procedure.

INGERSOLL STEEL DIVISION
Borg-Warner Corporation
310 South Michigan Avenue • Chicago, Illinois
Plants: Chicago, Ill. • New Castle, Ind. • Kalamazoo, Mich.

INGACLAD
STAINLESS-CLAD STEEL

Also Producers of Ingersoll Solid Stainless and Heat-Resisting Steels

above which efficiency of the oxidizing reactions becomes lower. In other words, while chemical efficiency increases with increasing injection rates up to a point, the efficiency-rate curve reaches a maximum and thereafter falls off. At present the injection rate for best efficiency appears to be approximately 100 cubic feet per minute for each ton.

Limitations to Injection Rates — In addition to the fact that there is an oxygen flow rate beyond which oxygen efficiency decreases, there are other practical limitations to injection rates. As injection rate increases, rate of reaction with the carbon becomes greater. While it is theoretically desirable to oxidize the bath as rapidly as possible, there is a point at which the carbon drop becomes too rapid for good control. In addition, very high injection rates on medium and higher carbon steels cause a violent evolution of carbon monoxide, splashing slag on the roof and side walls and causing serious refractory damage. The smaller the furnace the more important are these limitations.

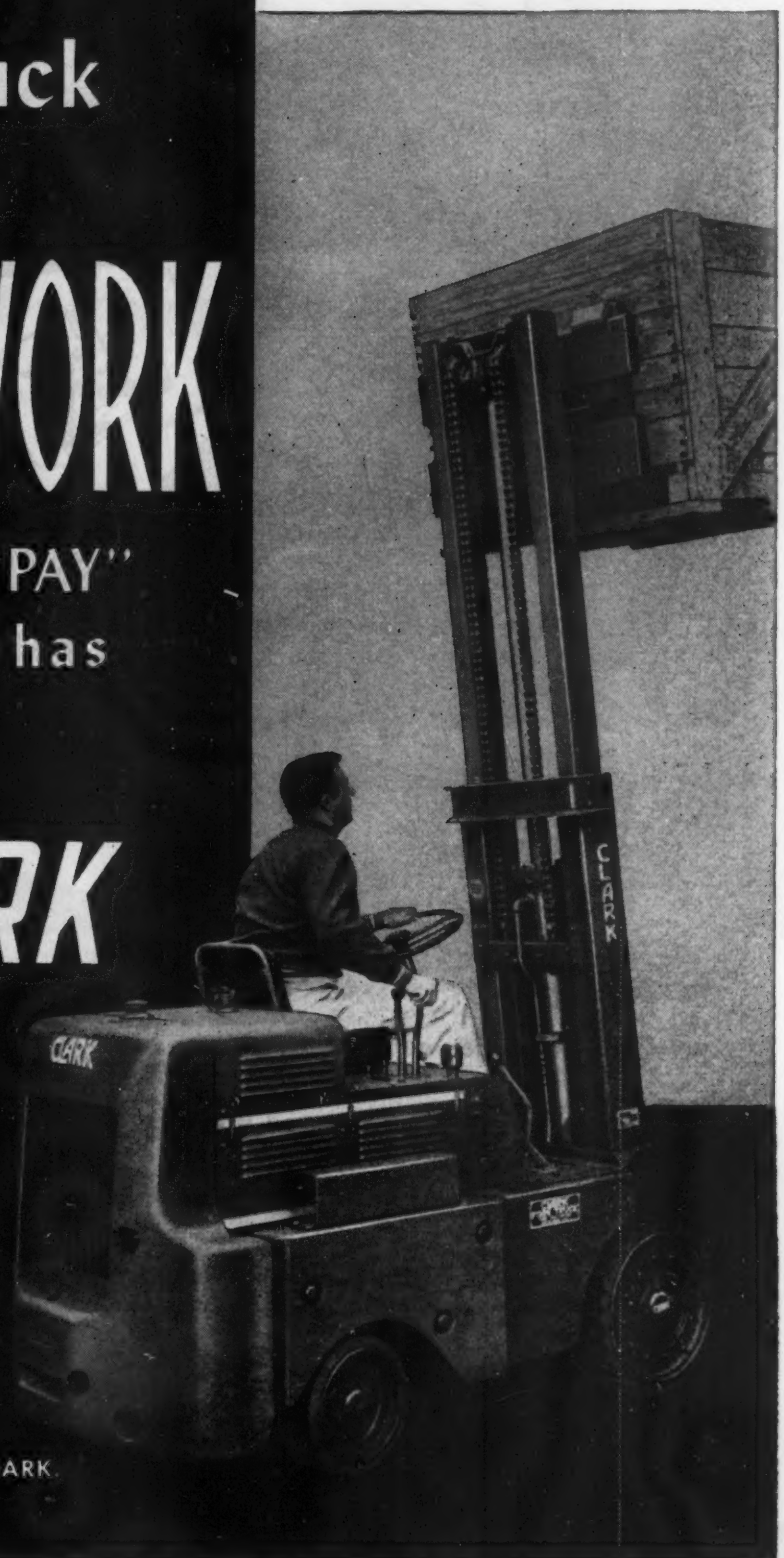
As a general rule in electric furnaces the optimum practical rate of injection falls below the point of maximum chemical efficiency. It is important, therefore, to examine electric furnace practice in respect to oxygen flow rate. The rate will vary depending on the nature of the charge and other conditions. For instance, while an oxygen flow rate of 20 to 30 cubic feet per minute per ton works out well for carbon steels, giving a carbon drop rate of 5 to 7 points per minute with reasonable control, higher rates of around 40 cubic feet per ton per minute are used in producing stainless steel in order to shorten injection time and obtain higher bath temperatures for selective oxidation of carbon in the presence of chromium.

Effect of Direct Oxidation on Bath Temperatures—An advantage of direct oxidation which is frequently overlooked is the effect on bath temperature. In ore practice the oxidation reactions are endothermic and tend to reduce temperature of the melt. In oxygen practice the oxidation reactions are exothermic to the extent that they will greatly increase melt temperature even without the assistance of power input. In oxygen practice the power is usually shut off during injection periods and heat of the reactions alone is sufficient to increase bath temperature appreciably. This saving in power makes it economical to use oxygen even on higher carbon steels. The greater the concentration of oxidizable ele-

This Fork Truck DOES MORE WORK

FOR LESS "PAY"
because it has

DYNA-TORK *Drive*

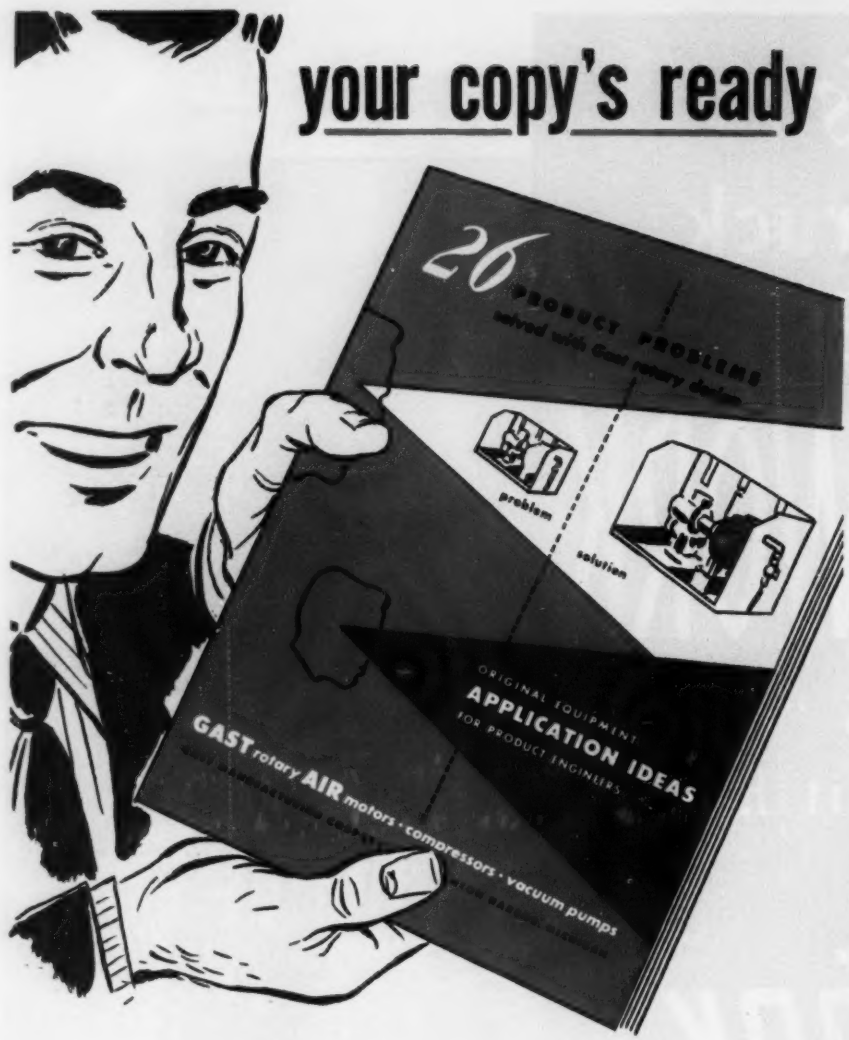


Available *only* in CLARK'S gasoline-powered Utilitruc, DYNATORK DRIVE eliminates the clutch and conventional transmission. Nothing comparable in the fork-lift-truck field. Benefits so numerous that the important question is: CAN YOU AFFORD TO BE WITHOUT IT?

To help get the answer—to enjoy unsurpassed counsel on any materials-handling matters—CONSULT CLARK. Please direct inquiries on your business letterhead to address listed below.

INDUSTRIAL TRUCK DIVISION
CLARK EQUIPMENT COMPANY
BATTLE CREEK 26, MICHIGAN

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS



Gast's new booklet...

packed with ideas for Product Designers

If you design machinery—or have a part in product development—you'll find this booklet a useful idea-source. It shows 26 examples of how *air* was put to work to solve product-function problems. And the actual problems solved range from feeding light materials into automatic machinery to simulating manifold vacuum conditions for testing automobile heaters.

In short, you'll find data on the use of air for all sorts of common and uncommon applications.

We believe it's a booklet you'll want to read through—and keep handy. For sooner or later, "Air may be *your* Answer" on one of your product design problems.

Write on your letterhead for a copy of "Application Ideas".

GAST ROTARY AIR MOTORS · COMPRESSORS · VACUUM PUMPS
(TO ONE H.P.) (TO 30 LBS.) (TO 28 INCHES)
GAST MANUFACTURING CORP., 133 Hinkley St., Benton Harbor, Mich.

ments in the melt, the more favorable the effect on the temperature.

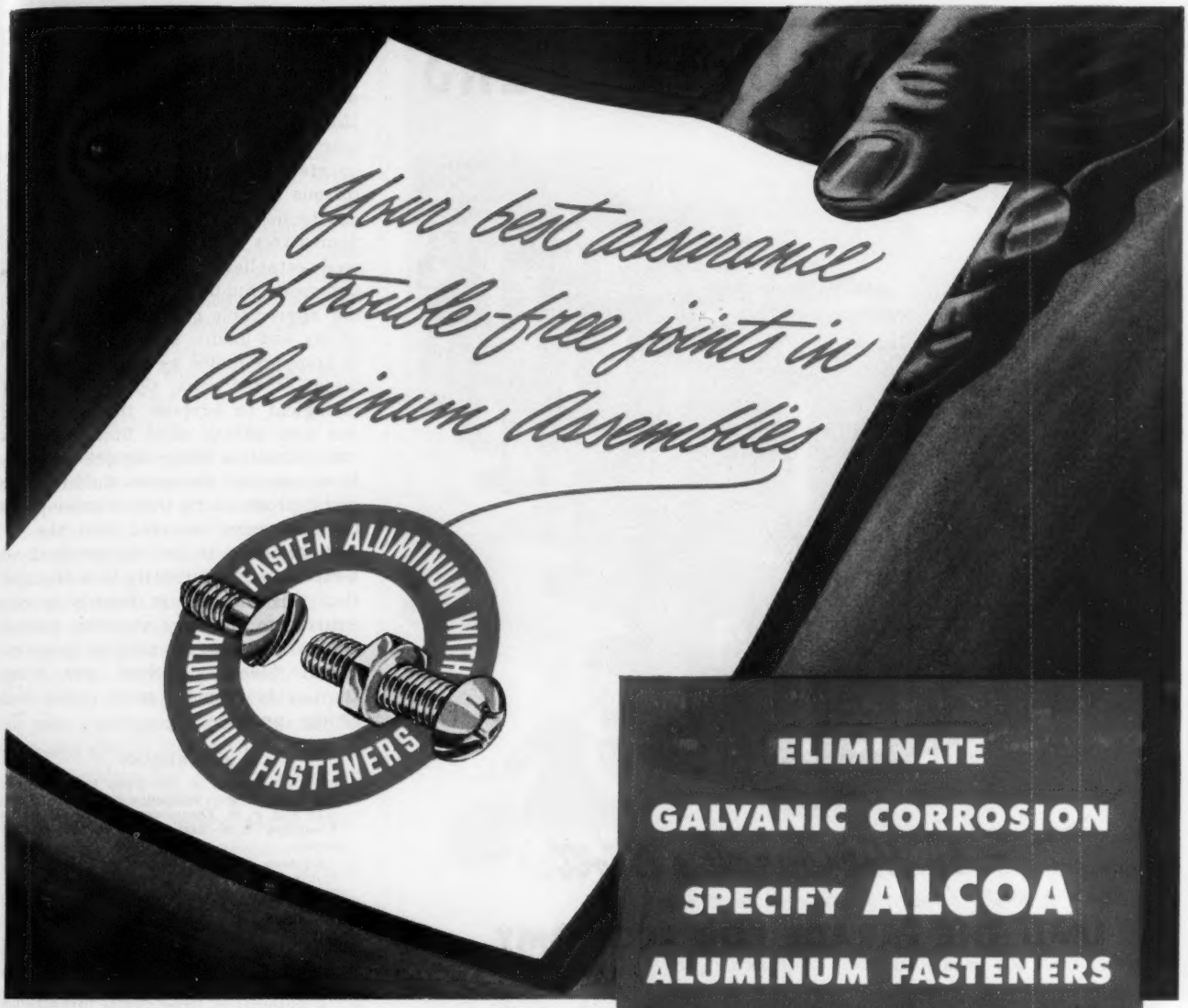
This favorable effect on bath temperature is especially valuable in stainless steel heats. Chromium oxidizes along with the carbon so that some loss of chromium during the oxidation period is inevitable. But oxidation rate of the chromium compared to that of carbon becomes less as the temperature is increased; thus the exothermic nature of the reactions in direct oxidation has a favorable effect in reducing chromium loss in stainless steel heats, since it increases the temperature rapidly at the point of the reactions.[3]

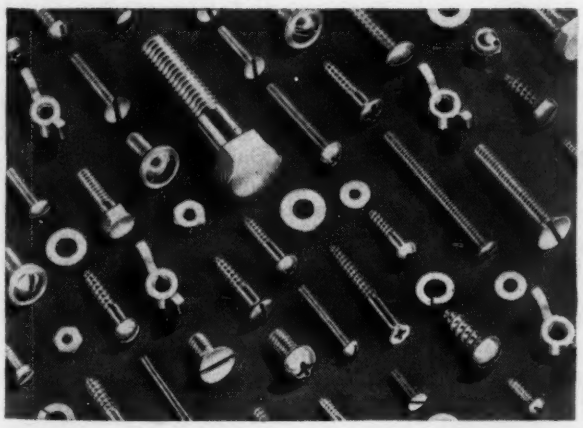
Air as a Source of Oxygen—There has been some serious thought given to use of air as a medium of introducing oxygen into the melt but this is not practical. Using air, approximately 4 volumes of useless nitrogen are introduced to get one volume of oxygen, so for an equal rate of oxygen input air volume must be five times oxygen volume. Unlike oxygen, nitrogen is not absorbed by the metal but bursts violently through the slag, throwing slag against the roof and side walls and causing rapid and serious damage to refractories. Furthermore, the beneficial temperature gain from direct oxidation reactions is partly offset by the cooling effect of large volume of inert gas in the air.

Oxygen was not adopted in the acid electric furnace until it had become established in producing low carbon and stainless steels in basic practice, but, since its adoption, experience has indicated that it has advantages to offer the operator of acid furnaces equal to those attainable in basic practice.

Because of greater amounts of oxidizable elements, other than carbon, present in acid steels at the start of the refining period, the temperature increase possible with oxygen is greater than in refining basic carbon steels. This has enabled most shops to justify oxygen use on the basis of power and ore that is saved alone.

Casting Porosity—One of the important methods available to reduce the dissolved gas content of molten steels is a vigorous carbon boil. It has been suggested that to ensure a satisfactory gas content in the final casting the carbon drop rate must be at least 40 points per hour.[4] This is sometimes difficult to achieve in ore practice. With oxygen, carbon drop rates in the order of 300 to 450 points per hour are readily achieved thus giving a far more vigorous boil than in older practice. Oxygen has been introduced as standard practice in one shop solely because of a marked





You can prevent the galvanic corrosion that can result when dissimilar metals are used to fasten aluminum assemblies: Fasten aluminum with Alcoa Aluminum Fasteners.

Alcoa Fasteners are available from stock with Phillips heads for fast, slip-free power driving, or slotted heads; in sheet metal, wood and machine screws; all popular sizes, standard threads. Nuts, bolts, washers, lock washers, solid or tubular rivets and cotter pins are also available.

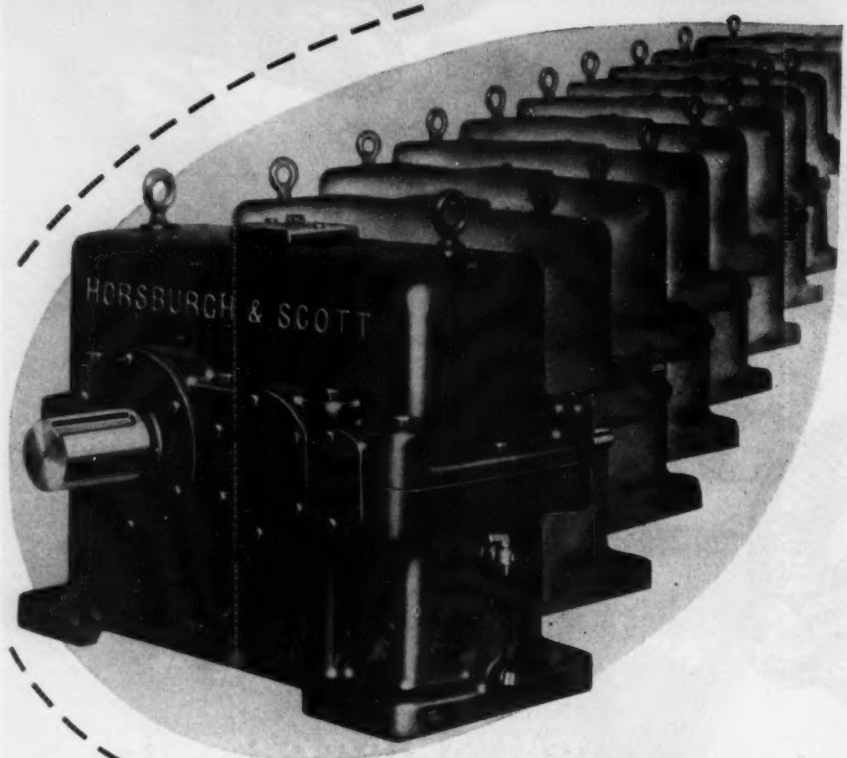
Investigate the low costs and sales advantages of Alcoa Aluminum Fasteners today. Write on your letterhead for free samples, specifying the type and size you'd like. ALUMINUM COMPANY OF AMERICA, 620F Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA

ALCOA *Aluminum* FASTENERS

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS

HELICAL SPEED REDUCERS



by Horsburgh & Scott

LEAD THE PARADE FOR ECONOMY

- **It's a two-way saving on Horsburgh & Scott Helical Speed Reducers:**

1. Simplicity of design lowers the cost of manufacture and assembly.

2. Rugged construction, finest materials and precision manufacture, minimize maintenance.

These features are your guarantee of better built speed reducers that are economical in first cost and throughout their long life.

Send note on Company Letterhead for Speed Reducer Catalog 46

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

decrease in number of castings rejected for porosity.

Fluidity is, of course, a function of the temperature of a molten metal. However, practical foundrymen have long suggested that fluidity varied at constant temperature. Work on nonferrous metals, where temperature can be measured accurately, has confirmed this suspicion and it is pretty well established that dissolved gas depresses fluidity; a metal containing appreciable gas in solution being sticky and unable to fill thin sections in complex molds as well as gas-free metal at the same temperature. It is logical to suppose that dissolved gas also affects steel fluidity. Several foundries using oxygen practice have reported increased fluidity over metal produced by their former practice and have asserted that the effect appears to be independent of temperature. Currently it is thought that this increase in fluidity is due entirely to the very vigorous carbon boil attainable in oxygen practice which flushes dissolved gas more thoroughly than the more gentle boil of ore practice.

REFERENCES

1. "Use of Oxygen in the Open Hearth Practice for Carbon Reduction." G. V. Slottman and F. B. Lounsberry, yearbook of the American Iron and Steel Institute, 1947 issue.
2. "Relation between Chromium and Carbon in the Refining of Chromium Steels." D. C. Hilty, Preprint Electric Furnace Steel Conference AIME, December 1948.
3. "Use of High-Purity Oxygen for Decarbonization in Five-Ton Acid Electric Furnaces." Wyman, Goehring, Faist, Preprint Electric Furnace Steel Conference AIME, December 1948.
4. "A Quantitative Experimental Investigation of the Hydrogen and Nitrogen Contents of Steel During Commercial Melting" Sims, Moore, and Williams, *Metals Technology*, Feb. 1948.

Celebrates 40 Years

Oakite Products Inc. of New York, celebrating 40 years of operation, has published a special issue of its house magazine, "Oakite News Service." A brief history of the company, scope of the Oakite service, photographs of its products in actual operation and information on the education of a new Oakite representative are contained in the booklet, now in its 33rd year of publication.

New Rebuilding Facilities

As a result of moving the machine division of Standard Pattern Works, Detroit, to a new building, enlarged facilities for rebuilding all types of metalworking machines are available. The company provides a method of lifting machines off the truck inside the building and placing them wherever they are required for the rebuilding process, thus saving time and labor.

Steel Hardenability

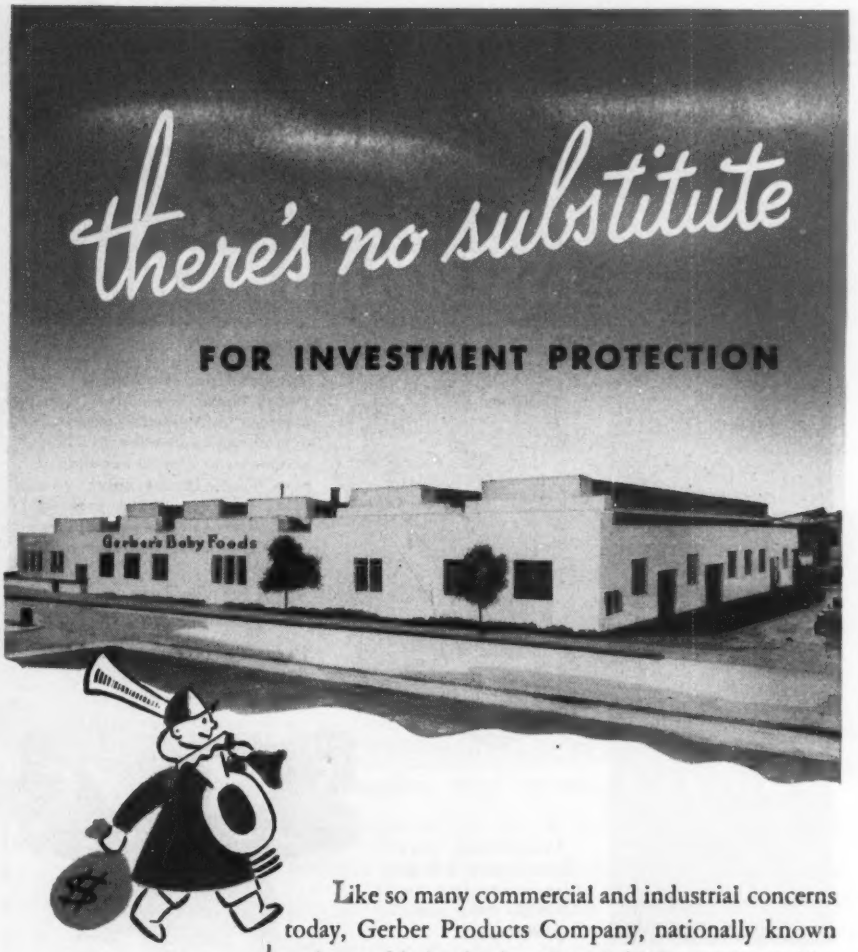
(*Continued from Page* 105)

Small specimens of the alloys which were prepared from the ingots as cast, and also from bars after forging and homogenizing, were quenched from various temperatures and a photographic record of the time-temperature relationship during the quench was obtained by means of sensitive string galvanometer apparatus. The cooling time or rate thus determined was correlated with the structure produced in the quenched specimen.

Size of Grains—Since the hardenability of most steels is influenced by the size of the grains at the time of quenching, a determination was made of the grain size established at the quenching temperatures of each alloy and steel used in the critical cooling rate and end-quench tests. The general trend was for the hardenability of the alloys, without and with boron, to increase (critical cooling rate decreased) as the size of the austenite grains increased.

To determine the primary effect of boron on hardenability, a comparison was made of the critical cooling rate of alloys of the same carbon content, without and with boron, when quenched from temperatures sufficiently high to ensure complete solution and uniform distribution of carbon in austenite of the same grain size. The effectiveness of boron in improving the hardenability of these alloys varied not only with the carbon content but also with the prior history (whether tested as cast or as forged and homogenized). With the forged and homogenized alloys, no significant improvement in hardenability was obtained by the addition of boron. With the alloys as cast, the hardenability was markedly improved by the addition of boron with carbon content of 0.3 or 0.5 per cent, but the presence of boron in the 0.7 per cent carbon alloy again had no material effect on its hardenability. The observed difference in hardenability could not be ascribed to a grain-size effect.

Results of Tests—Results of the tests made on specimens initially as cast showed that the boron-treated alloys containing 0.3 and 0.5 per cent carbon had about the same hardenability and this was greater than that of the 0.7 per cent carbon alloy. Thus, the effectiveness of boron in increasing the hardenability of these alloys decreased as the carbon content increased; that is, the improvement due to boron was very pronounced with 0.3 per cent, intermediate with



TYPICAL
"Automatic" Sprinkler
PROTECTED PROPERTIES

Industrial Plants
Storage - Warehousing
Mercantiles
Piers - Wharves
Aviation Properties
Hospitals - Institutions
Hotels - Apartments
Schools - Colleges
Offices - Public Buildings

"Automatic" FIRE-FOG
provides positive protection for severe fire hazards

Like so many commercial and industrial concerns today, Gerber Products Company, nationally known makers of baby foods, selected "Automatic" Sprinkler investment protection for their modern plant in Oakland, California. Their choice as you'll understand from the following, was a wise one; for in addition to safeguarding the lives of some 600 valued employees, "Automatic" Sprinkler protection is remarkable from an investment point of view. The sprinkler installation in this case allowed for immediate insurance premium reductions of $24,000.00 annually . . . savings which will amortize the cost of protection in about 4½ years, following which annual dividends will continue to accumulate.

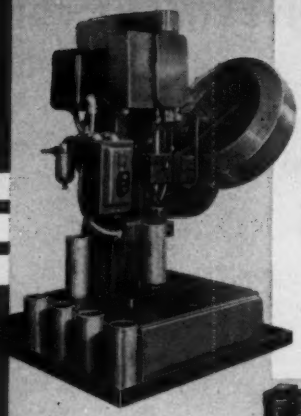
This particular illustration is not unusual, for depending upon the risk, insurance savings of upward to 90% may be realized through the installation of "Automatic" Sprinkler protection. It's good reason why thousands of business executives throughout the country specify multi-value fire protection with "Automatic" Sprinklers, *an important investment today . . . perhaps welcomed protection tomorrow.*

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FOR INVESTMENT PROTECTION
DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

Yes! WE DO MAKE Special ASSEMBLING MACHINES

MOTORIZED HOPPER UNITS

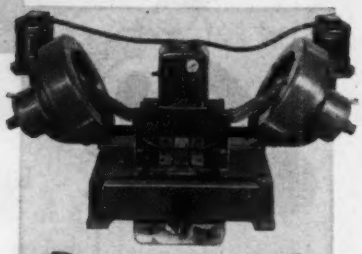


Motorized Hopper Units by the Detroit Power Screwdriver Company are "tailor-made" for special assembling applications . . . They eliminate the manual handling of parts . . . Let us solve your production assembling problem . . . Contact us now; send special assembly and component parts for quotation.

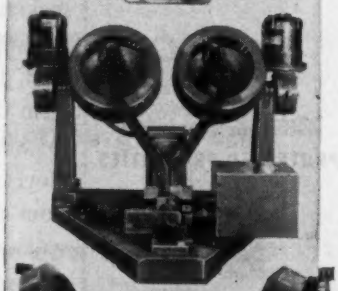
•

Pressing terminal studs in dry cell batteries.

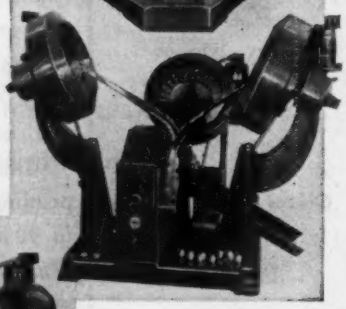
MAGAZINE FEED POWER SCREWDRIVERS



Assembling small hardware hinges by inserting two hinge pins simultaneously.

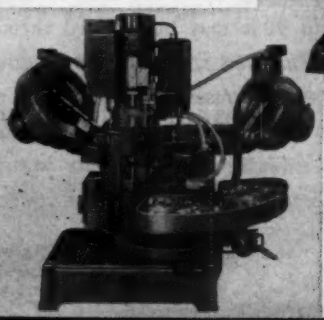


Inserting mounting screws in cooking utensil handles.



Automatic assembly of toy plastic wheels and axles.

MAGAZINE FEED NUT DRIVERS



Assembling screw and fibre washer to cable clamp for electrical outlet box for shipping purposes.

DETROIT POWER SCREWDRIVER CO.

2811 W. FORT ST. • DETROIT 16, MICH.

0.5 per cent, and nil with 0.7 per cent carbon.

Since boron improved the hardenability of the two alloys (0.3 and 0.5 per cent carbon) in the initial condition as cast but was practically without effect after hot working and homogenizing, it is clearly apparent that the action of boron on hardenability was adversely affected during the course of these treatments, probably by the exposure to the relatively high forging temperature.

Boron was lost in the decarburized zone of commercial steels. Evidence indicated that the diffusion rate of boron in austenite is of the same order of magnitude as that of carbon.

Action of boron in increasing the hardenability of steel is not definitely known, but tentative explanations have been reported in the literature. These theories may be classified on the basis that (1) the improvement is due to boron in solid solution in austenite, and (2) a reaction of boron with some other element to change the condition of the latter.

Boron's Effectiveness — The bureau's results and those published previously strongly support the conclusion that the effectiveness of boron in enhancing the hardenability of certain steels is due entirely to its action while in solid solution in austenite. Only the portion of boron that is in solution at the time of quenching contributes toward an increase in hardenability. Boron undissolved or in the form of compounds is either without effect, or possibly decreases hardenability by acting as transformation centers for austenite in the temperature range where pearlite is formed.

In addition to dissolving in austenite, boron can exist in steel in the form of compounds with nitrogen, oxygen, iron and carbon. Some of these compounds are stable and are not decomposed at temperatures ordinarily used in the heat treatment of boron-treated steels, whereas other compounds containing boron may be partially or entirely decomposed at these temperatures. Some data indicate an increase in solubility of boron in gamma iron with increasing temperature, whereas other results indicate a decrease in solubility with increasing temperature in this field. In any event, only a very small amount of boron is retained in solution at heat treating temperatures, and it is possible to obtain the maximum response in the hardenability of certain steels by relatively minute additions of this element.

When boron enhances the hardenability of a steel, it decreases the rate of nucleation and not the rate

Gray Iron resists CORROSION.

Gray Iron Characteristics Include:

- Castability
- Rigidity
- Low Notch Sensitivity
- Wear Resistance
- Heat Resistance
- CORROSION RESISTANCE
- Machinability
- Vibration Absorption
- Durability
- Wide Strength Range

● ● This gray iron casting is a water-jacketed manifold for a marine engine. *High resistance to corrosion* is an essential property for this service. The casting must also possess good machinability, heat resistance and low thermal expansion. The intricate structure of the part illustrates the unique castability of gray iron.

Termed by many engineers *the most important material of construction in chemical engineering,* gray iron's ability to resist corrosion is shown by its wide use in chemical plant equipment such as pumps, retorts, pipes, valves and fittings. Continuous service of cast-iron water mains for *over 100 years* is dramatic evidence of this property of gray iron.

Are you taking full advantage of the unmatched combination of useful properties offered by Gray Iron and its various alloyed forms . . . plus its ultimate economy?

Send for free booklet "GRAY IRON—Its Mechanical and Engineering Characteristics, and Details for Designing Cast Components".

Make It Better With Gray Iron

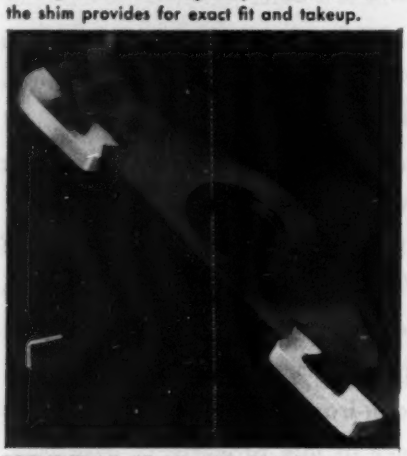
GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY BANK BLDG., CLEVELAND 14, OHIO

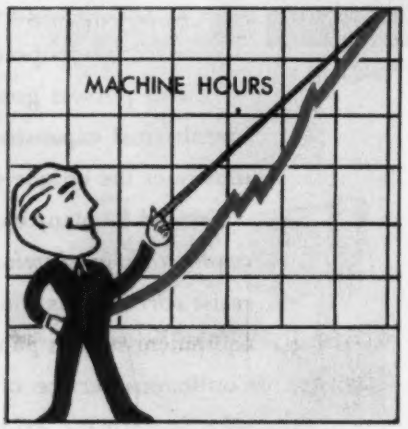
LAMINUM* SHIMS GIVE THE FULL SAVINGS OF SHIM DESIGN!

PRECISION ADJUSTMENTS by simply peeling laminations. No grinding, miking, filing. Machining tolerances are greatly increased because the shim provides for exact fit and takeup.

AT-THE-JOB ADJUSTMENTS. No need for standby lathe or operator. The only tool required is a jackknife to peel off a .002" or .003" lamination.



PREVENTION OF OIL AND PRESSURE LOSS. Fitted with babbitted lugs, LAMINUM shims will also seal oil in the bearings of high speed pressure-lubricated equipment.



LESS "DOWN TIME" FOR THE USER. The use of LAMINUM provides a permanent adjustment feature to allow for wear and preserve critical accuracy.

Send today for chart illustrating 46 money-saving, time-saving applications, detailed specifications, sample of LAMINUM.

PRECISION STAMPINGS in any quantity

Let us quote on your *difficult* stamping jobs. Our experience, tools and presses are geared for *close tolerance* production.

* LAMINUM (Reg. U. S. Pat. Off.) shims are solidly bonded laminations of .002 or .003 inch precision gauge brass or steel with a microscopic layer of metallic binder. Cut to your exact specifications.

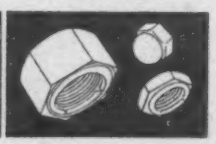
LAMINUM
THE SOLID SHIM THAT peels FOR ADJUSTMENT

LAMINATED SHIM COMPANY, Inc.
3406 Union Street Glenbrook, Conn.

SHIMS

SHIM STOCK

STAMPINGS



AN-COR-LOX NUTS

of growth of ferrite and carbide. The boron atom, believed to be located interstitially in the gamma iron lattice, is effective in retarding either the rate of formation of nuclei or the rate of their growth to the critical size necessary for transformation to begin, or both.

REFERENCES

1. "Influence of Boron on Some Properties of Experimental and Commercial Steel" by Thomas G. Digges and Fred M. Reinhart, J. Res. NBS 39, 67 (1947) RP1815

2. For further technical detail see "Effect of Boron on the Hardenability of High-Purity Alloy and Commercial Steels" by Thomas G. Digges, Carolyn R. Irish and Nesbit L. Carwile, J. Res. NBS 41, 545 (1948) RP1938

Photomicrography Manual

Illustrated with 171 photographs and diagrams and including tables and optical formulas is a comprehensive manual on photomicrography prepared by the Carl Zeiss Co. of Germany. Available through the Office of Technical Services of the Department of Commerce, Washington, D. C., the manual presents the general photographic and optical theory underlying the use of microscope and camera and covers image formation by lenses, scale of projection and magnification, simple and compound microscopes, depth definition and methods of illumination. Designated as PB 92781, it is available in photostat or microfilm form.

Travels at Truck Speeds

Convertible to all crane and shovel attachments and traveling at truck speeds, a new ½-yard, 10-ton truck-mounted crane and excavator, announced by Wayne Crane Division of American Steel Dredge Co., Fort Wayne, Ind., swings at 5½ rpm. The six-wheel, tandem-type carrier is of 16-inch, 45-pound steel I-beam construction. Outrigger tubes are integral with the frame. Crane features four 20-inch clutches and gears are fully enclosed and running in oil. Diesel or gasoline engines are available.

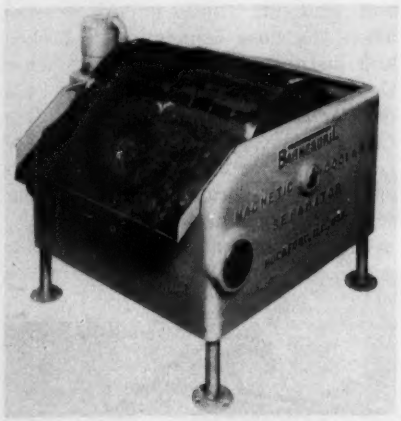
Strap Selector Offered

Proper selection of strapping for various conditions is facilitated by an anticorrosion strap selector offered by A. J. Gerrard & Co., Melrose Park, Ill. In operating the device, the user dials an arrow so that the arrow-head points to the type of chemical condition, atmospheric environment, soil, water or gas fumes to which the strapping will be exposed. An opening in the butt section of the arrow automatically reveals which metals will, and will not give good service under the specified condition.

New Products and Equipment

Coolant Separator

Reduction of floor space required and use of a small gearmotor are improvements incorporated in the 5, 10, 20 and 40 gallon per minute magnetic coolant separators, offered by Barnes Drill Co., 814 Chestnut St., Rockford, Ill. Convenience of installation is much greater with the direct intake of used coolant from the work



and discharge of clean coolant from either side of the separator direct to the coolant storage tank.

New separators are designed for lower level intake, eliminating the necessity of an extra pump to deliver the used coolant to it. On the 20 gallon size, the used coolant intake is 10¼ inches from the floor and the outlet for clean coolant is 6⅞ inches minimum. Height is adjustable to suit requirements. A light weight aluminum housing makes installation easier. Magnetic power is furnished by permanent alnico magnets.

Check No. 1 on Reply Card for more Details

Jaw Clamps

Almost every size and shape of work piece may be quickly and firmly held against the face plate or table of a machine with the jaw clamp, manufactured by J & S Tool Co. Inc., 477 Main St., East Orange, N. J. No part of the clamp is higher than 15/16-inch. Full surface of work ⅜-inch high or over may be machined because the jaw itself is only 23/64-inch thick.

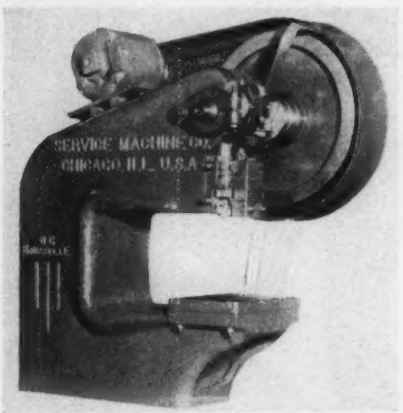
Clamp can be used in machining operation on lathes, planers, milling machines, drill presses and other machine tools. Each clamp has one adjusting screw. Clamps are made of tool steel and tested for 2-ton down pressure. When screw in the jaw clamp is turned to the right, the jaw moves in a direction that forces the work piece horizontally toward the opposite jaw clamp and at the same time downward against the table or face plate.

Check No. 2 on Reply Card for more Details

Deep Throat Press

Available in both bench and floor models is a new 5 ton Rousselle deep throat press, manufactured by Service Machine Co., 7627 S. Ashland Ave., Chicago 20, Ill. The No. OG machine, which has a 12-inch throat, permits working to the center of 24 inch sheets. Press frame is an extra heavy semisteel casting, heavily ribbed.

Press has a heavy duty clutch and can be set for single stroke or con-



tinuous operation. Speed of operation is 250 strokes per minute. The bench model, complete with motor, weighs about 550 pounds.

Check No. 3 on Reply Card for more Details

Measuring Microscope

Precision measuring and the control of profiles on the basis of enlarged drawings is possible with the new type profile-measuring microscope available in the United States from Hauser Machine Tool Corp., Manhasset, N. Y., factory representative of Henri Hauser Ltd., Bienne, Switzerland. Instrument accomplishes a comparison of the enlarged projected image with a correspondingly enlarged outline drawing of the particular tool, thread, gage, etc. Enlargement may be 6, 10, 20, 30 or 50 times full size.

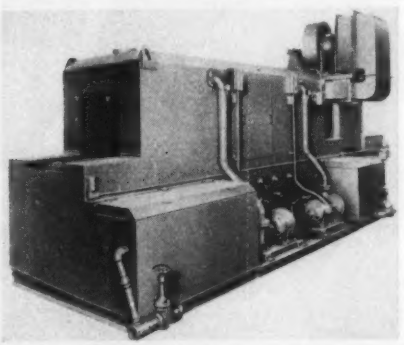
Drawings for use with the instrument can be executed to within 0.004 to 0.006-inch without difficulty. Assuming a magnification of 30X, the error in the accuracy of the drawings referred to the object is of the order of 0.00012 to 0.0002-inch. For comparison and for the purpose of checking dimensions, only the contour outline of the object is drawn; the thickness of the lines is of no consequence and does not affect the measurement's accuracy. Largest diameter of measurement possible is 3 17/32 inch.

Check No. 4 on Reply Card for more Details

Parts Washer

Standardized construction so that multiple wash, rinse and dry-off stages may be incorporated at minimum cost is a feature of the WB-100-S and WB-200-S metal parts washers, manufactured by Detrex Corp., Detroit 32, Mich. The single and double spray-zone units are designed so that if only spray stages are installed originally, a blow-off stage may be added at any time later. Either may be used as a standard metal parts washers for ordinary alkali cleaning compounds, or converted to efficiently handle compounds which have a tendency to foam.

Work is pressure-sprayed from rigidly supported multiple spray head-



ers. All headers are provided with removable plugs for easy cleanout. It is not necessary to enter the machine for cleanout purposes. The blow-off stage may be steam or gas heated, or built to give cold-air blast. Position of each blow-off nozzle is easily adjustable.

Check No. 5 on Reply Card for more Details

Profile Grinder

Designed for high-speed grinding of internal and external contours, curved, odd and irregular surfaces, is the bench-type profile grinder introduced by Rice Pump & Machine Co., 1025-B S. 40th St., Milwaukee 4, Wis. Use may be for grinding of die clearances, sharpening cutter

"MULTICUT" "TUFCUT" "HOT WORK"

Wapakoneta
SHEAR BLADES
and ROTARY KNIVES

Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.

TOOL

Rx ENGINEERED TO THE JOB

Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

The WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
Wapakoneta, Ohio

dies and punches, grinding cams and finishing hardened steel parts.

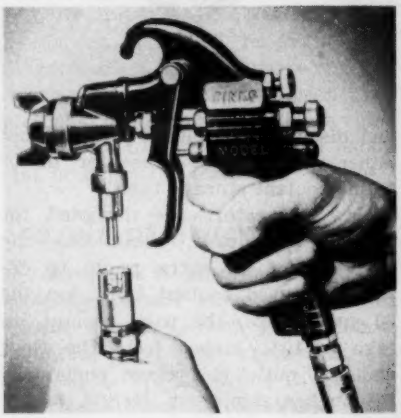
A collet chuck permits easy removal and insertion of grinding wheels and provides absolute true running of wheels. A compound tilting mechanism tilts work table 30 degrees to front and 15 degrees to side. Vertical adjustment is 3¼ inches. Models for mounted stone and high-speed carbide wheels differ only in spindle speed.

Check No. 6 on Reply Card for more Details

Hose Connection

A quick-detachable connection that will shut off fluids under pressure when the hose connection is broken and instantly restore the flow when the connection is re-established, is a development of Binks Mfg. Co., 3122 Carroll Ave., Chicago 12, Ill. The connection, for use in the material or fluid lines of spray painting systems, will not leak, stick, jam or squirt.

Using a bayonet-type joint, the connection can be made or broken



almost instantly, with a slight turn of the wrist. Unit incorporates no washers or gaskets. Connection is made in standard material hose sizes, with standard threads to fit all Binks fittings, spray guns and spray painting equipment.

Check No. 7 on Reply Card for more Details

Fork Truck

A number of chassis improvements feature the redesigned Trucloader fork-lift truck of 1000 pounds capacity, announced by Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. Gas tank is attached to the rear of the frame and is partially enclosed by the counterweight which also is redesigned to a more rounded contour and with additional weight.

Steering column has been moved forward to provide more leg room and lift and tilt levers have been relocated in the same positions as

VANADIUM

FOR WELDABILITY

WRITE US FOR DATA ON THE SUPERIOR
WELDING PROPERTIES OF VANADIUM STEELS

VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • PITTSBURGH • CHICAGO • DETROIT • CLEVELAND

MAKERS OF FERRO-ALLOYS

VANCORAM

CHEMICALS AND METALS

30 YEARS of Continuous Experience in The Production of

Metal pouring from one of the 1000-pound Induction Furnaces.

HEAT—CORROSION—ABRASION—RESISTANT

ALLOY CASTINGS

Chemical Laboratory and Balance Room in the modern Laboratory Building completed in 1948.

Producing alloy castings for so many years for a host of important industrials has given Michiana a file of performance data and practical experience invaluable to every user of alloy castings.

LONGER HOURS OF SERVICE

Michiana experience assures definite performance results—long hours of service. From the laboratory, through the hands of experienced foundrymen to final inspection, the alloy castings made for you are under the supervision and control of an able staff of metallurgists.

MICHIANA PRODUCTS CORPORATION

Michigan City, Indiana

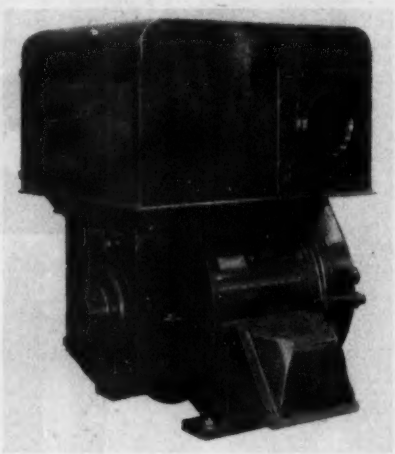
MP CORP.

on other Clark models. Floor plates can be easily removed and replaced. Accessibility to the engine compartment is improved by hinged louvers on either side.

Check No. 8 on Reply Card for more Details

Unit-Cooled Motors

Standard totally-enclosed, unit-cooled direct current motors in ratings up to 200 hp are offered with a cooling assembly which enables them to operate at slow speeds for long periods of time, according to General Electric Co., Schenectady 5, N. Y. Two blowers, driven by a single Tri-Clad induction motor in the air-to-air cooling assembly pro-



vide ventilation independent of motor speed. One blower circulates internal air through the motor and unit cooler, while the other blows external air through the cooler.

Cooling system makes full torque possible down to almost zero speed continuously. Unit cooler is built of pressed-steel sheets which have been stacked and welded together, at the edges to provide alternate air passages at right angles to each other. Motor air never comes into contact with the contaminated outside air.

Check No. 9 on Reply Card for more Details

Milling Machine Adapter

Tools used in milling machine operation may be quickly changed with the Harding rotary adapter manufactured by Greenville Tool & Die Co., Greenville, Mich. Tools are ejected by tapping the release button located on the face of the adapter. Ejection is by a built-in hydraulic force.

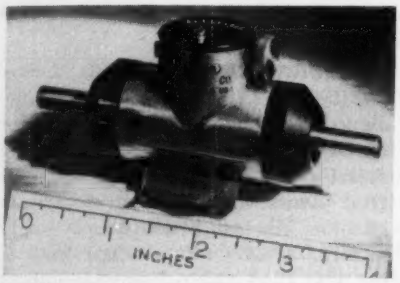
Adapter design is conventional and will fit any milling machine spindle. Unit will hold any tool having a Morse taper shank. At present, the standard holders are manufactured

in both No. 40 and 50 styles. Other holders can be secured for any special taper either inside or out, or both.

Check No. 10 on Reply Card for more Details

Speed Changer

Weighing less than 6 ounces, the miniature variable-ratio speed changer, offered by Metron Instrument Co., 432 Lincoln St., Denver 9, Colo., can deliver up to 70 ounce-inches torque and 0.025 hp. Ratio of input to output speeds is infinitely adjustable between 1 to 6 increase and 6 to 1 decrease, with a total speed change of 36 to 1. A dial and pointer



indicate ratio setting and the adjusting knob is equipped with friction drag to prevent ratio wander.

Maximum output torque is obtainable at zero speed and operating speeds as high as 20,000 rpm are practical. Internal construction employs rollers, contacting disks on input and output shafts. Speed is adjusted by changing radius at which rollers make contact. Provision is made to increase contact pressure automatically when load torque is increased, this insuring high maximum output torque, minimum reduction in speed with increased load and low loss when lightly loaded.

Check No. 11 on Reply Card for more Details

Electronic Speed Control

Remote pushbutton control, dynamic braking, automatic reversing, inching, jogging, controlled acceleration and deceleration and control of input torque or horsepower may be obtained with the electronic speed control unit for machinery prime-movers, announced by Industrial Associates, 8845 W. Olympic Blvd., Beverly Hills, Calif. Known as the Varitronic drive, it can be installed on existing equipment or engineered as part of the equipment at the time of the original installation.

Control is essentially a simplified system for utilizing the recognized flexible performance characteristics of direct current motors, but operated from an alternating current power source. It embraces either constant torque or constant horsepower and control can be held within limits as close as 2 per cent of basic speed. The chance of machine overloading or damage by operator is virtually eliminated with the installation of the control unit.

Check No. 12 on Reply Card for more Details

Force Indicator

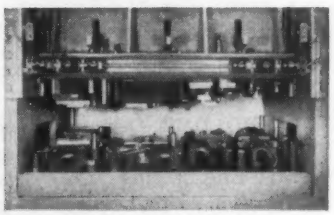
Utilizing a precision compensated spring system to give easy force measurements accurate to ½ graduation or ½ of 1 per cent at full scale of the dial diameter is a force indicator designed by Hunter Spring Co., Lansdale, Pa. Spring system is composed of the main compression spring, the compensating extension spring and the load-transmission rod-centering springs and the springs internal to the dial indicator. Force is applied to the system through a load transmission rod. Movement of this rod deflects the compensated spring system which is measured by a low friction dial indicator which indicates the force that has been applied to the system.

Instrument is shaped for easy one-

DE-STA-CO *Versatility* WORKS FOR YOU!

Automatic Transmission Oil Pan. Formerly tied up two presses; now confined in one press with two dies, cutoff and draw and redraw. Result . . . saving on press labor, saving on handling.

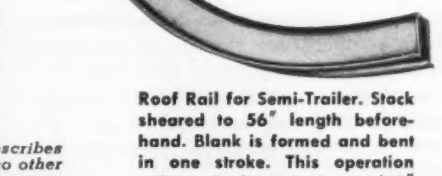
The three parts illustrated are typical of the versatile performance we get from just *one* of our presses. By taking every advantage of modern, high-production equipment, large bed area, progressive tooling and every mechanical aid, we save for you—our customer. That's why buyers across the nation say: "For medium-large jobs and smaller, Detroit Stamping's our Number One source."



Washing Machine Water Intake Manifold. Originally used four presses. By use of four individual dies in one large press, savings of 25% on press labor, 30% on handling were obtained.

Analyze *your* component stampings. Probably there are several that could be handled better the De-Sta-Co way. You'll find it profitable and pleasant to join our distinguished clientele, customers who have helped us build a reputation for

- Reliability, resulting from 35 years of well-kept promises
- Helpful experience and tool-engineering "know-how"
- Broad production scope from first-class equipment
- Devotion to service and quality



Roof Rail for Semi-Trailer. Stock sheared to 56" length beforehand. Blank is formed and bent in one stroke. This operation utilizes the large bed area (48" x 72") and long stroke (10").

Our new booklet, "Stampings", describes our plant, over 75 presses—also other equipment, and the range of our production. Please write for your copy and the name of our Stampings Sales Representative in your area.

DETROIT STAMPING COMPANY
359 Midland Avenue Detroit 3, Michigan

Manufacturers of famous De-Sta-Co Toggle Clamps, Arbor Spacers, Shims, Shim Stock, Blower Housings, Refrigerator Compressor Valves.

hand operation. Six stainless steel force-transmission rod fittings give the instrument a wide range of usefulness. Attachments include a simple thrust button, a pulling hook, conical point-force applicator, V-notch thrust fitting for lateral rod pressures, chisel fittings for re-entrant edges and notches and a 6-inch extension rod. The indicator is currently available in a 10-pound capacity.

Check No. 13 on Reply Card for more Details

• • •

ELECTRODE HOLDERS: P. R. Mallory & Co. Inc., Indianapolis, Ind., announces a new bench type welding electrode holder designed to save setting up time and eliminate need for bending and machining special tips. It has a full 180 degree range of head adjustment with positive locking in any position under full operating pressures.

Check No. 14 on Reply Card for more Details

ADAPTER: An adapter for Taper-Lock bushings has been introduced by Dodge Mfg. Corp., Mishawaka, Ind. Adapters are recommended for use where it is more convenient to use a straight bore in the hub than to drill and taper bore hubs to accommodate the bushings. It consists of a taper bored sleeve which fits into the straight bore of the hub.

Check No. 15 on Reply Card for more Details

TOOL HOLDER. Designated as Kwik Switch, a tool holder offered by Universal Engineering Co., Frankenmuth, Mich., can be used to change tools on jobs requiring multiple operations such as drilling, tapping, boring and still maintain accuracy.

Check No. 16 on Reply Card for more Details

CRAYONS AND PELLETS: Tempil Corp., New York 11, N. Y., announces development of additional high temperature ratings of crayons and pellets. Beginning with 113° F, Tempilsticks° and pellets are available in 12½ degree steps to 400° F and in 50 degree steps from 400 to 2000° F.

Check No. 17 on Reply Card for more Details

CUTTING OIL: Excel No. 60 improved high sulphur ester cutting oil, which is stable under all operating conditions, is offered for machining of stainless, chrome nickel alloys and Monel, by Oil Products Co. Inc., 4105 S. LaSalle St., Chicago 9, Ill. Better finish and increased tool life with close limits are obtainable at higher speeds and feeds. Company is offering any quantity up to 50 gallons on a special trial offer.

Check No. 18 on Reply Card for more Details

TIPPING DEVICE: Manning, Maxwell & Moore Inc., Shaw-Box Crane & Hoist Division, Muskegon, Mich., announces a device to tip loads of any kind after they have been lifted and hold them in any desired position. Designated as Tipit, it has a capacity of 2000 pounds.

Check No. 19 on Reply Card for more Details

COILS: A new type heating and cooling coils for plating, degreasing, pickling and anodizing tanks are announced by Udylite Corp., Detroit 11, Mich. Designated as Platecoils, they offer higher Btu capacity per square foot of area, rapid even heat transfer, small coil space, easy installation and low maintenance cost. They are available in cold rolled steel, stainless and Monel.

Check No. 20 on Reply Card for more Details

SWIVEL BALL JOINT COUPLING: A new swivel ball joint coupling, offered by Kelite Products Inc., Los Angeles 54, Calif., makes it possible to absorb vibration and movement in all installations where pipe cannot be rigidly supported. The O ring seal principle provides a positive seal against leakage at any pressure.

Check No. 21 on Reply Card for more Details

VALVES: A new line of single-solenoid valves for air pressures of 0 to 125 psi is announced by Valvair Corp., Akron, O. Sizes offered are ¼, ⅜ and ½-inch, spring return. All sizes are available for 110, 220 and 440 v in both 50-60 cycle and 25 cycle current.

Check No. 22 on Reply Card for more Details

TAPPING COMPOUND: Cimcool Division, Cincinnati Milling Machine Co., Cincinnati 9, O., announces a tapping compound that is a chemical emulsion in water, an extreme lubricant. It can be brushed directly on the tap or on machines with combined operations it can be dissolved in Cimcool cutting fluid.

Check No. 23 on Reply Card for more Details

TAPS: National Precision Tool Co., Carnegie, Pa., offers D-Line double-end taps which are reversible. Floating tap holders are also available.

Check No. 24 on Reply Card for more Details

PROTECTIVE GASKETING: A zinc chromate impregnated gasketing material called Chrome Lock is announced by Products Research Co., Glendale, Calif. It prevents corrosion, inhibits electrolytic action between dissimilar metals and permits less machining on flange facings as well as lighter flanging materials. Available in 1/32, 1/16, 1/18 and 1/4-inch thicknesses and any width from 3/16-inch to 72 inches.

Check No. 25 on Reply Card for more Details

PUMPS: Designed particularly for use on power units, truck applications and materials handling equipment, John S. Barnes Corp., Rockford, Ill., announces addition of a line of high pressure pumps to its Constant-Flo rotary gear pumps. Pumps maintain continuous pressure up to 1000 psi and intermittent pressure up to 1500 psi.

Check No. 26 on Reply Card for more Details

AIR CRANKING MOTOR: Leece-Neville Co., Cleveland, O., has designed a new air cranking motor for quick and dependable starting of diesel and gasoline engines in industrial plants where use of electric or gasoline starters constitutes a safety hazard. A 20 cu ft storage tank at not less than 150 psi provides about 30 seconds cranking.

Check No. 27 on Reply Card for more Details

COUNTERS: A scientific and industrial counter that can be actuated by any electrical pulse or signal from a contact switch, photo tube and amplifier, metal detector, etc., is announced by Streeter-Amet Co., Chicago 13, Ill. It can be used in conjunction with an arc welder, drill press or other power device. When load changes beyond a certain point, a count is registered.

Check No. 28 on Reply Card for more Details

SAW BLADES: Carbide-tipped and cast-alloy tipped saw blades have been added to the Triple-Chip segmental and solid saw blades line of Motch & Merryweather Machinery Co., Cleveland 13, O. Segmental tipped blades are made in diameters up to 18 inches. Blades are recommended for sawing plastics and nonferrous material and for milling of ferrous and nonferrous materials.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

SENATE passage of a bill permitting freight absorption and delivered pricing in the absence of collusion is viewed favorably by steel producers and consumers though trade leaders are withholding public comment pending study of the proposed law. As a general thing, the view is expressed that the measure, if enacted, will clarify a highly muddled pricing situation which has prevailed for almost a year, and will provide the means for return to sound pricing procedure in the sale of steel products.

FREIGHT ABSORPTION— Whether the steel industry will return all the way to the basing point method of quoting in event such is made legal is uncertain. In some trade circles it is felt high freight rates make it uneconomical for sellers to absorb freight on the scale they have in the past. Consequently, it would not be surprising if they continued to concentrate sales efforts as close to producing plants as possible. In the case of producers at excess production points, such as Pittsburgh and Youngstown, however, it is believed the proposed permanent legislation passed by the Senate will prove a lifesaver.

STEEL DEMAND— Meanwhile, new business of the steelmakers continues to slide off, although here and there sellers report the drop is being cushioned to some extent by protective buying arising from the desire of consumers to round out inventories against the threat of shipment interruptions resulting from possible labor disturbances this summer in the coal and steel industries. In the main, however, consumers are watching inventories closely. As a result with new orders limited and shipments to consumers being maintained at a high level, steel mill order backlogs are shrinking steadily, and in some instances have reached a point where producers have been forced to curtail operations, at both furnaces and finishing mills.

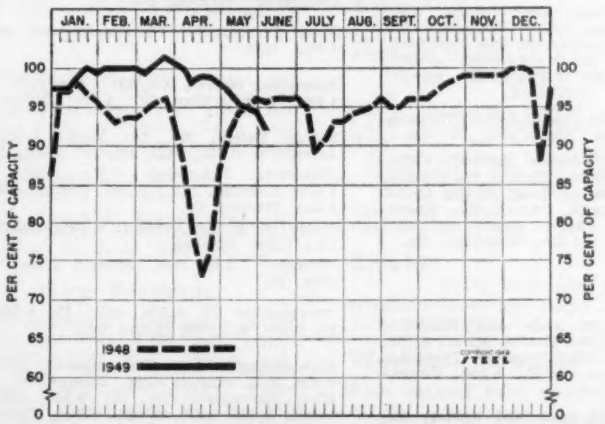
PRODUCTION— Steel ingot operations dropped 2½ points last week to 92 per cent of capacity, a new low for the year to date. This is equivalent to production of about 1,695,000 tons of ingots and castings compared with 1,730,400 tons a year ago.

SUPPLIES— With demand off and supplies increasingly plentiful steel sellers are scrambling for orders. Only here and there are reports heard of supply pinches. Plates are more freely available with some mills able to book tonnage for rolling this month. Quota limitations have been lifted on exports. Hot carbon bar requirements of consumers continue to slide off, while demand for cold-drawn and alloy bars is sluggish. Flat-rolled products are in tightest supply. Galvanized sheets are still the most scarce item in the product list, but some falling off in volume is noted in this category. Cold-rolled sheets also are still on the tight side though easier as compared with a few weeks ago.

PRICES— For the present steel product prices at the mill level are holding steady. Consumers, however, anticipate some downward adjustments both in base prices and extra cards. Such changes, if they come, are not likely to be effected pending settlement of the steel wage question, still some weeks distant. Meanwhile, premium prices continue to fade out with at least one platemaker effecting a reduction last week. At the same time, a number of downward price revisions have been effected by the warehouses, products involved including galvanized sheets, cold-finished bars and alloy steel bars.

COMPOSITES— For the ninth consecutive week STEEL's composite for steelmaking scrap declined and is now $21.83 compared with $22 for the previous week and $40.67 for the like week a year ago. Other composites held unchanged from the preceding week and compare with a year ago as follows: Finished steel, $92.77 and $80.27; semifinished steel, $66.72 and $68.62; steelmaking pig iron, $45.60 and $40.49.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended June 4	Change	Same Week 1948	Same Week 1947
Pittsburgh	87.5	— 6.5*	95	101.5
Chicago	98	— 1*	96	96
Eastern Pa.	86.5	— 5	89	93
Youngstown	103	— 2	103	93
Wheeling	86	None	89	89
Cleveland	101.5	— 3	94.5	96
Buffalo	101.5	+ 5.5*	93	88.5
Birmingham	100	None	100	99
New England	58	+ 2	78	95
Cincinnati	90	— 4	100	85
St. Louis	73.5	— 4.5	89.5	82
Detroit	85	+15	100	90
Western	84.5	— 0.5	..	..
Estimated national rate	92	— 2.5	95.5	96.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Revised.

News Summary—P. 67 *Engineering News—P. 97*

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	June 4	May 28	Month Ago May 1949	Year Ago June 1948	5 Years Ago June 1944
Finished Steel	$92.77	$92.77	$93.36	$80.27	$56.73
Semifinished Steel	66.72	66.72	66.72	68.62	36.00
Steelmaking Pig Iron	45.60	45.60	45.66	40.49	23.00
Steelmaking Scrap	21.83	22.00	22.29	40.67	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Apr. 1949	4.02714c
Mar. 1949	4.05098c
Feb. 1949	4.06149c
Apr. 1948	3.62766c
Apr. 1944	2.43493c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. April, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	June 4, 1949	May 1949	Mar. 1949	June 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.43c	2.875c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.365
Steel bars, Chicago mills	3.35	3.35	3.35	2.875
Shapes, Pittsburgh mills	3.25	3.25	3.275	2.775
Shapes, Chicago mills	3.25	3.25	3.25	2.775
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	2.98
Plates, Pittsburgh mills	3.40	3.40	3.50	2.925
Plates, Chicago mills	3.40	3.40	3.40	2.925
Plates, del. Philadelphia	3.5848	3.6348	3.7256	3.21
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.275	2.775
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.50
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.775
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.50
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.90
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.40	3.05
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.775
Bright basic, wire, Pittsburgh	4.15	4.15	4.255	3.725
Wire nails, Pittsburgh mills	5.15	5.15	5.525	5.125
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.70

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$60.00
Slabs, Chicago	52.00	52.00	52.00	45.00
Rerolling billets, Pittsburgh	52.00	52.00	56.20	45.00
Wire rod 7/32 to ¼-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

* Nominal. † 1.50 lb coating.

Pig Iron

	June 4, 1949	May 1949	Mar. 1949	June 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$44.08
Basic, Valley	46.00	46.00	46.00	39.00
Basic, eastern, del. Philadelphia	49.39	49.39	50.3002	42.17
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	43.58
No. 2 fdry., del. Philadelphia	49.89	49.89	50.8002	42.67
No. 2 foundry, Chicago	46.25	46.25	46.25	39.00
No. 2 foundry, Valley	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham	39.38	39.88	43.38	39.38
Southern No. 2 del. Cincinnati	45.43	45.93	49.43	45.09
Malleable, Valley	46.50	46.50	46.50	39.50
Malleable, Chicago	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	58.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	170.20	151.15*

* F.o.b. cars Pittsburgh.

SCRAP

Heavy melt. steel, No. 1, Pittsburgh	$23.00	$23.25	$36.30	$40.25
Heavy melt. steel, No. 2, E. Pa.	19.00	19.56	30.70	39.00
Heavy melt. steel, No. 1, Chicago	21.50	21.50	33.30	39.25
Heavy melt. steel, No. 1 Valley	22.00	22.00	35.85	40.25
Heavy melt. steel, No. 1 Cleveland	18.50	18.50	34.10	39.75
Heavy melt. steel, No. 1, Buffalo	22.25	22.81	35.95	43.00
Rails for rerolling, Chicago	27.75	27.75	43.85	53.75
No. 1 cast, Chicago	27.50	27.50	39.20	68.38

COKE

Connellsville, beehive furnace	$14.25	$14.25	$14.50	$13.00
Connellsville, beehive foundry	16.25	16.75	17.00	15.22
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, nom.; offered at $65 per net ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $65-$70 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles. Basic open-hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c, Atlanta; 3.55c, Ecorse, Mich.; 4.00c Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Struthers, O., Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.75c, Conshohocken, Pa.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.05c, Torrance Calif.; 5.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburgh, Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren. Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren. O. Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O. Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except; 5.15c, Youngstown, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.40c, Atlanta; 4.00c, Pittsburg, Torrance, Calif.; 4.20c, Kansas City, Mo.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.65c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip (0.25 carbon and less); 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.00-4.50c, New Castle, Pa., Youngstown; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.25-4.45c, Detroit; 4.50c New Haven, Conn., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N.J.; 4.85c, Wallingford, Conn.; 5.55c, Fontana, Calif.; 5.75c, Los Angeles. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base. and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.25-4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Struthers, O., Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich., mill.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.50c, Coatesville, Pa.; 3.55c, Conshohocken, Pa.; 3.50c, Claymont, Del., Ecorse, Mich.; 3.95c, Harrisburg, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston; 4.35c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.45c, Ecorse, Mich.; 5.65c, Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.75c, Phoenixville, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 3.80c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Struthers, O.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 123, Pittsburg, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 116, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ¾ x 6-in. and shorter	37 off
⅝-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅜-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅝-in.-1-in.	.....	37 off
1⅛-in.-1⅛-in.	37 off	35 off
1⅛-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6-in. and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers. Net to $1 off

For prices of stainless and tool steels please refer to May 30 issue, Page 103.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton. Discounts from base follow:

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	39½– 41½	11– 13	1	46½– 48½	30½– 32½
¼	37½– 39½	13– 15	1¼	47– 49	31– 33
⅜	34– 36	9½– 11½	1½	47½– 49½	31½– 33½
½	41– 43	23½– 25½	2	48– 50	32– 34
¾	44– 46	27½– 29½	2½, 3	48½– 50½	32½– 34½
			3½ & 4	44½	28

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	40½	24	38½	22	28– 38½	11½– 22
2½	44½	28	41½	25	33½– 41½	17– 25
3	44½	28	41½	25	36– 41½	19½– 25
3½&4	42½– 46½	25– 30	43½	27	38½– 43½	22– 27
5 & 6	42½– 44½	25– 28	43½	27	43½	27
7	....	....	....	....	43½	26

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	40½	12	1¼	46–	31–
¼	38½	14		48	32
⅜	35	10½	1½	46½– 48½	31½– 32½
½	40– 42	23½– 24½	2	47– 49	32– 33
¾	43– 45	27½– 28½	2½ & 3	47½– 49½	32½– 33½
1	45½– 47½	30½– 31½	3½ & 4	43½	27

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	23	37½	21	27– 37½	10½– 21
2½	43½	27	40½	24	32½– 40½	16– 24
3	43½	27	40½	24	35– 40½	18½– 24
3½-4	41½– 45½	27½– 29	42½	26	37½– 42½	21– 26
5 & 6	41½– 43½	27– 27½	42½	26	42½	26
8	45½	28	44½	27	44½	27
10	45	27½	44	26½	44	26½
12	44	26½	43	25½	43	25½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+59	+90½	1¼	+22	+47½
½	+20	+47½	1½	+15½	+40
¾	+10	+36½	2	+ 7½	+31
1 and 1¼	+ 4	+27½	2½-3	+ 5	+26½
1½	— 2	+24	4	List	+20½
2	— 2½	+23½	4½-8	+ 2	+22
			9-12	+12	+31½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D.	B.W.	Seamless		Elec. Weld	
In.	Ga.	H.R.	C.D.	H.R.	C.D.
1	13	.....	13.39-14.64	13.00	13.00
1¼	13	.....	15.87-17.34	13.21	15.39
1½	13	16.45	17.71-19.35	14.60	17.18
1¾	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2¼	13	23.36	25.16-27.50	20.73	24.40
2½	12	23.54-25.73	27.70-30.28	22.83	26.88
2¾	12	25.79-28.19	30.33-33.15	25.02	29.41
3	12	27.33-29.87	32.14-35.13	26.51	31.18
3½	12	28.68-31.35	33.76-36.90	27.82	32.74
3¼	11	33.39-36.50	39.29-42.95	32.39	38.11
3½	11	35.85-39.19	42.20-46.13	34.78	40.94
4	10	44.51-48.65	52.35-57.22	43.17	50.78
4½	9	58.99-64.47	69.42-75.88	....	....
5	9	68.28-74.64	80.35-87.82	....	....
6	7	104.82-114.57	123.33-134.81	....	....

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.30, Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§**Chicago,** district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.50	53.00	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	49.40	49.90	50.40	....
Ironton, Utah, furnace	47.00	47.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$59.50
6.51-7.00.. 60.50 9.01- 9.50. 65.50
7.01-7.50.. 61.50 9.51-10.00. 66.50
7.51-8.00.. 62.50 10.01-10.50. 67.50
8.01-8.50.. 63.50 10.51-11.00. 68.50
8.51-9.00.. 64.50 11.01-11.50. 69.50

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorous. F.o.b. furnace, Lyles, Tenn.....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Inches Length	Cents per lb f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
6	48, 60	19.00
4 5¼	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-15.00
Connellsville, foundry	16.00-16.50
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens, New England, del.‡	22.70
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24.16
Terre Haute, ovens	20.20
Milwaukee, ovens	21.15
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens
(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia	$45.00

Per pound, ovens
(Effective as of Oct. 1)

Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50

(Effective as of Oct. 25)

Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅝" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)
Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%: Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian—	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H. R. Rds.	C. F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.00‡	6.51	7.15	5.82	...	5.77	6.56	8.68	5.53	5.90	7.36
New York (c'try)	5.80‡	6.31	6.95	5.62	...	5.57	6.36	8.48	5.33	5.70	7.16
Boston (city) ..	6.10‡	6.70**	7.16	5.80	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try) .	5.95‡	6.55**	7.01	5.65	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)...	5.72‡	6.64**	6.83	5.60	...	5.55	6.34	8.40	5.25	5.53	6.74
Phila. (c'try)..	5.57‡	6.59**	6.68	5.45	...	5.40	...	8.25	5.10	5.38	6.59
Balt. (city)....	5.46	6.36	6.96	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.81	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	6.05**	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85‡	5.90**	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]	6.90	5.00	6.00	4.90	5.65	9.20-9.60††	4.90	5.05-5.10	6.55
Detroit (w'hse)	5.42	6.22[4]	7.43	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.80-6.91	5.15-5.18	6.15	5.15-5.16	5.60-5.85	8.00-8.40	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.65-6.76	5.00-5.03	6.00	5.00-5.01	5.45-5.70	7.85-8.25	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.98	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city).	5.00-5.20‡	5.90[4]	7.10	5.00	6.67-6.83	5.05	5.60	7.85[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.95	4.85	6.52-6.68	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.28	5.18	6.82-7.01	5.23	5.73	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.20	...	6.60	5.20	...	5.15	6.83	...	5.15	5.40	7.73[9]
Birm'ham(c'try)	5.05	...	6.45	5.05	...	5.00	6.68	...	5.00	5.25	7.58[9]
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	8.20	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	8.05	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[8]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70†‡	9.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.30[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; ††as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.ob. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10 % C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5 for max 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb. 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, corload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5 per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr.) Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ⅛ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

**(Small size—weighing approx, 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(Please turn to Page 176)

For prices of other ferroalloy products please refer to May 30 issue, page 126.

Zinc Prices Decline Further

Market at 10.75c is 6.75 cents under postwar high and at new low since Jan. 20, 1948. General undertone of nonferrous metals remains weak on lack of buying

New York—Price of zinc declined ¼-cent to 10.75c a pound, East St. Louis, on June 2. The new level is 6.75 cents under the postwar high of 17.50c that prevailed from November, 1948, to Mar. 23, 1949. The decline was attributed to inability of custom smelters to dispose of daily intake at the previous prices.

Consumers of zinc, as well as copper and lead, have failed to re-enter the market despite recent sharp reductions in price.

Bulk of business in metals is now being done on an average or price-at-time-of-shipment basis.

Lead—Clinton H. Crane, chairman of the board, St. Joseph Lead Co., told stockholders at their recent meeting that it would not require over a full year to recover from the effect of the present decline in consumption and prices and he was confident that prices would not be as low as they were before the war, because of currency inflation.

Producers of lead products reduced prices as of May 31 to levels based on 12-cent common lead.

The leading producer of lead in Canada reduced his prices 1 cent a pound to the basis of 11.75c, delivered Montreal or Toronto, on May 30.

Copper—Brass firms in the Connecticut valley are involved in negotiations with the Progressive Metalworkers Council which is demanding a 35-hour week, 40 hours pay and liberalization of health, accident and pension plans. The Council has appealed for a special National Labor Relations Board election at the Ansonia branch of the American Brass Co. to determine future bargaining rights. Bargaining rights at several other plants also are being contested. Labor trouble has also flared up at some of the western copper mines.

Copper and Brass—Leading makers of brass and bronze ingots reduced price 1¼ to 2 cents a pound, effective June 1. Prices in the 85-5-5-5 group were reduced 1½ cents; in the 88-10-2 group, 2 cents; yellow ingot group, 1¼ cents; in the miscellaneous group, 1½ cents.

Tin—Exports of tin concentrates from Bolivia amounted to the equivalent of 2467 tons of fine tin during April, compared with 2847 tons in March, making the total for the first four months of this year 9803 tons against 11,547 tons in the like 1948 period. Production in that country currently is curtailed as a result of widespread strike of tin miners.

Explains Slump in Copper

New York — Extraordinary conditions in the domestic market for copper, and not the increase this year in imports of the metal, caused the recent slump in prices and consumption, C. Donald Dallas, chairman of the board, Revere Copper & Brass Inc., this city, said in a statement opposing current proposals to restore the import tax on copper.

The tax, which has been set at 2 cents a pound under the reciprocal trade agreements, was suspended to June 30, 1950, by act of Congress earlier this year.

Refuting the argument that the tax should be reimposed because foreign copper has been coming to the country far in excess of requirements, Mr. Dallas pointed out that the increase in imports was a temporary condition brought about by an abnormal demand. He said imports in the first quarter, amounting to 85,800 tons against 59,800 tons in the like 1948 period, were largely contracted for in the closing months of 1948, when there was still an acute shortage of copper in this country.

He also pointed out that exports for the first quarter were higher at 39,400 tons compared with 33,600 tons a year ago. There was some importing for stockpiling, but Mr. Dallas estimates that a single producer brought in more than half of the total imports for the supply of his own fabricating subsidiaries.

"The slump in copper price was part of a general trend in prices," he said, "accentuated by the desire of consumers to reduce inventories, accumulated during the period of shortage, and in the copper industry by the extraordinary uncertainty in prices. . . . Fabricating companies have contributed to this confusion by pricing on a price-time-of-shipment basis, instead of on the firm price basis on which they purchase their raw materials and also by basing their prices on the limited custom smelter market instead of the producers' market.

"When the market is stabilized at a fair level, copper consumption should resume its normal relationship to the general level of business. . . . Government needs form a substantial backlog of demand.

"Recent information from Washington is that total government programs (all security needs, including military, stockpiling and RCA) will require almost 16 per cent of normal supply of copper, including imports. This normally available supply is about 1,500,000 tons a year, so the security programs will take about 240,000 tons a year, a fundamental demand never before established in peace time."

Metal Price Averages For May

(cents per pound)

Electrolytic Copper, del. Conn.	18.045
Lead, St. Louis	13.566
Prime, Western Zinc, E. St. Louis	11.880
Straits Tin, New York	103.000
Primary Aluminum Ingots, del.	17.000
Antimony, f.o.b. Laredo, Tex.	38.500
Nickel, f.o.b. refinery	40.000
Silver, New York	71.500

Tin Consumption Declines

Washington — Industrial consumption of tin during the first quarter of this year dropped 12.4 per cent below that of the preceding quarter and almost 14 per cent below the 1948 average, according to the Office of Domestic Commerce, this city. The slump was general throughout all the major consumption categories with bronzes and solders particularly hard hit.

Consumption of tin and tin in alloys amounted to 19,481 tons in the first quarter compared with 22,228 tons in the fourth quarter and 22,868 tons in the first quarter of last year. Consumption in the first quarter of 1949 and the fourth quarter of 1948 was, respectively, as follows in the major products: Tin and terne plate, 7967 and 8575 long tons; brass and bronze, 4369 and 5281; solder, 4037 and 4932; and babbitt, 1429 and 1617.

Stocks of tin in the United States on Apr. 1 totaled 69,764 tons and were virtually unchanged from what they were a year ago. This accounting excludes from consideration the status of strategic reserve stocks which were considerably augmented in the 12-month period. During the first quarter, government stocks held by the Reconstruction Finance Corp. increased 3581 tons to 27,903 tons of pig tin while those of concentrates declined 168 tons to 18,861 tons, making a total of 46,764 tons compared with 43,351 tons as of Jan. 1. Industrial held stocks declined 1293 tons to 13,699 tons of pig tin and 51 tons to 9301 tons of "other," making total private stocks 23,000 tons as of Apr. 1 against 24,344 tons on Jan. 1, 1949.

New supply of secondary tin amounted to 6318 tons in the first quarter compared with 7375 tons in the fourth quarter and 7572 tons in the first quarter of last year. During the first three months of this year, 851 tons of secondary pig tin were produced while 5467 tons of recoverable tin were in receipts of alloy scrap.

PIG TIN

	Oct.-Dec. 1948	Jan.-Mar. 1949
Opening Stocks:		
Government*	41,575	24,322
Industrial	13,039	14,992
Total	54,614	39,314
Supply:		
Tin Processing Corp. Output	8,370	9,617
Detinners Output	907	851
Imports	14,600	11,915
Total	23,877	22,383
Consumption†:		
Tin Plate	8,459	7,886
Other	7,289	6,037
Total	15,748	13,923
Closing Stocks:		
Government*	24,322	27,903
Industrial	14,992	13,699
Total	39,314	41,602

* Excludes Munitions Board stocks. † Excludes Munitions Board transfers.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley; Lake, Nom., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.75-15.50c; 88-10-2 (No. 215) 23.50c; 80-10-10 (No. 305) 20.00c; No. 1 yellow (No. 405) 12.25-13.25c.

Zinc: Prime western 10.75c, brass special 11.00c, intermediate 11.25c, East St. Louis; high grade 11.75c, delivered.

Lead: Common 11.85c; chemical, nom.; corroding, 11.95c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 15.50-15.75; No. 12 foundry alloy (No. 2 grade) 14.25-14.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 15.50-15.75; grade 2, 14.50-14.75; grade 3, 13.50-13.75; grade 4, 12.50-12.75. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $81-$84 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $72-$75 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 31.68; yellow brass 29.10; commercial bronze, 95%, 31.73; 90%, 31.38; red brass, 85%, 30.51; 80%, 30.17; best quality, 29.84; nickel silver, 18%, 42.42; phosphor-bronze, grade A, 5%, 50.82.

Rods: Copper, hot rolled 27.53; cold drawn 28.78; yellow brass, free cutting, 23.69; commercial bronze, 95% 31.42; 90% 31.07; red brass 85% 30.20; 80% 29.86.

Seamless Tubing: Copper 31.72; yellow brass 32.11; commercial bronze 90% 34.04; red brass 85% 33.42; 80% 33.08.

Wire: Yellow brass 29.39; commercial bronze, 95% 32.02; 90% 31.67; red brass, 85% 30.80; 80% 30.46; best quality brass 30.13.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.80, l.c.l. 24.42½, c.l. 23.92½; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.60, l.c.l. 26.22½; magnet, delivered, c.l. 28.00, 15,000 lb or more 28.25, l.c.l. 28.75.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and Bends: List price plus 45%.

ZINC

Sheets, 15.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 14.75c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 13.75c; over 12-in., 14.75c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c, Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May Avg..	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
Apr. Avg..	21.774	15.017	14.085	103.000	17.000	38.500	40.000	71.500
May 2-5 ..	18.50	14.80-14.85	12.50	103.00	17.00	38.50	40.00	71.50
May 6-7 ..	18.50	13.85	12.50	103.00	17.00	38.50	40.00	71.50
May 9-21 .	18.00	13.85	12.00	103.00	17.00	38.50	40.00	71.50
May 23 ...	18.00	12.85	12.00	103.00	17.00	38.50	40.00	71.50
May 24 ...	18.00	12.85	11.00	103.00	17.00	38.50	40.00	71.50
May 25 ...	17.625	12.85	11.00	103.00	17.00	38.50	40.00	71.50
May 26-31.	17.625	11.85	11.00	103.00	17.00	38.50	40.00	71.50
June 1 ...	17.625	11.85	11.00	103.00	17.00	38.50	40.00	71.50
June 2 ...	17.625	11.85	10.75	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 23.84c; oval 27.84c; cast 26.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.500	15.500	14.625
Yellow brass	13.250	13.000	12.500
Commercial Bronze			
95%	14.625	14.375	13.875
90%	14.500	14.250	13.750
Red Brass			
85%	14.375	14.125	13.625
80%	14.250	14.000	13.500
Best Quality (71-80%)	14.125	13.875	13.375
Muntz Metal	12.625	12.375	11.875
Nickel, silver, 10%	15.125	14.875	7.5625
Phos. bronze, A	17.375	17.125	16.125
Naval brass	13.125	12.875	12.375
Manganese bronze	13.125	12.875	12.250

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 13.00, No. 2 copper 12.00, light copper 11.00, composition red brass 10.00, radiators 7.75, heavy yellow brass 7.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.00, No. 2 copper 12.00, light copper 11.00, refinery brass (60% copper), per dry copper content 10.50-11.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 11.25-11.50, No. 2 10.25-10.50, light copper 9.25-9.50, No. 1 composition red brass 8.50-8.75, No. 1 composition turnings 8.00-8.25, mixed brass turnings 5.25-5.50, new brass clippings 10.50-11.00; No. 1 brass rod turning 7.50-7.75, light brass 5.25-5.75, heavy yellow brass 6.00-6.25, new brass rod ends 7.50-7.75, auto radiators, unsweated 6.25-6.50, cocks and faucets 7.75-8.00, brass pipe 8.00-8.25.

Lead: Heavy 7.00-7.50, battery plates 3.50-3.75, linotype and stereotype 10.25-10.50, electrotype 9.00-9.25, mixed babbitt 10.50-11.00, solder joints, 10.00-10.50.

Zinc: Old zinc 3.75-4.25, new die cast scrap 3.50-4.00, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00, siphon tops 44.00-46.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 6.00-6.50, crankcase 6.00-6.50, borings and turnings 3.00-3.50, pistons, free of struts, 6.00-6.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt	$23.00
No. 2 Heavy Melt	21.00
No. 1 Busheling	23.00
No. 1 Bundles	23.00
No. 2 Bundles	19.00-19.50
No. 3 Bundles	18.00-18.50
Heavy Turnings	17.50-18.00
Machine Shop Turnings	14.50-15.50‡
Mixed Borings, Turnings	14.50-15.50‡
Short Shovel Turnings	18.00-18.50
Cast Iron Borings	18.00-18.50
Bar Crops and Plate	25.00-25.50
Low Phos. Steel	25.00-25.50

Cast Iron Grades†

No. 1 Cupola Cast	23.00-23.50
No. 1 Machinery Cast	28.00-29.00
Charging Box Cast	25.50-26.50
Heavy Breakable Cast	24.00-25.00
Brake Shoe	25.00-26.00

Railroad Scrap

No. 1 R.R. Heavy Melt	23.50-24.50
Axles	27.00-27.50
Rails, Random Lengths	26.50-27.00*
Rails, 2 ft and under	31.00-32.00
Rails, 18 in. and under	32.00-33.00
Railroad Specialties	27.50-28.00
Angles, Splice Bars	30.00-31.00

†Offering price.
*Brokers' buying prices.
‡Crushers buying prices.

CLEVELAND

Heavy Melt. Steel	$18.00-19.00
No. 1 Busheling	18.00-19.00
No. 2 Bundles	16.00-17.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	17.50-18.00
Short Shovel Turnings	17.50-18.00
Cast Iron Borings	17.50-18.00
Bar Crops and Plate	19.50-20.50†
Punchings & Plate Scrap	19.50-20.50†
Cut Structurals	20.50-21.50†

Cast Iron Grades†

No. 1 Cupola	27.00-28.00
Charging Box Cast	25.00-26.00
Stove Plate	21.00-22.00
Heavy Breakable Cast	19.00-20.00
Unstripped Motor Blocks	19.00-20.00
Malleable	21.00-22.00
Brake Shoes	20.00-20.50
Clean Auto Cast	30.00-30.50
No. 1 Wheels	25.00-26.00
Burnt Cast	18.00-19.00

Railroad Scrap

No. 1 R.R. Heavy Melt	24.00-25.00
R.R. Malleable	23.00-24.00†
Rails, 3 ft and under	32.00-33.00
Rails, Random Lengths	26.00-27.00
Cast Steel	28.00
Railroad Specialties	28.00
Uncut Tires	24.00
Angles, Splice Bars	29.00-30.00

† Nominal.

VALLEY

Heavy Melt. Steel	$22.00†
No. 1 Bundles	22.00†
No. 2 Bundles	19.00†
Machine Shop Turnings	13.50-14.00†
Short Shovel Turnings	18.50-19.00†
Cast Iron Borings	18.50-19.00†
Low Phos.	23.00-23.50†

Railroad Scrap

No. 1 R.R. Heavy Melt	25.00-26.00

† Nominal.

MANSFIELD

Machine Shop Turnings	$13.50-14.00†
Short Shovel Turnings	17.50-18.00†

† Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$21.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	18.00
Machine Shop Turnings	10.00
Mixed Borings, Turnings	10.00
Short Shovel Turnings	10.00
Cast Iron Borings	11.00

Cast Iron Grades

No. 1 Cupola Cast	28.00
Charging Box Cast	22.00
Heavy Breakable Cast	20.00
Stove Plate	17.00
Unstripped Motor Blocks	16.00
Brake Shoes	17.00
Clean Auto Cast	28.00
Drop Broken Cast	31.00

Railroad Scrap

No. 1 R.R. Heavy Melt	21.00
R.R. Malleable	20.00
Rails, Rerolling	25.00
Rails, Random Lengths	22.00
Rails, 18 in. and under	32.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles	$15.50-16.00
No. 2 Bundles	12.50-13.00
No. 2 Heavy Melt. Steel	13.00-13.50
No. 1 Busheling	15.50-16.00
Machine Shop Turnings	11.00-12.00
Mixed Borings, Turnings	11.00-12.00
Short Shovel Turnings	12.00-13.00
Cast Iron Borings	13.00-14.00
Punchings & Plate Scrap	15.50-16.00

Cast Iron Grades

No. 1 Cupola Cast	22.00-24.00
Heavy Breakable Cast	17.00-19.00
Clean Auto Cast	22.00-24.00

BUFFALO

No. 1 Heavy Melt. Steel	$21.50-22.00
No. 2 Heavy Melt. Steel	18.75-19.25
No. 1 Bundles	18.75-19.25
No. 1 Bushelings	18.75-19.25
No. 2 Bundles	16.75-17.25
Machine Shop Turnings	13.00-13.50
Mixed Borings, Turnings	15.00-16.00
Cast Iron Borings	15.00-16.00
Short Shovelings	15.50-16.00
Low Phos.	22.50-23.00

Cast Iron Grades

No. 1 Cupola	26.00-27.00
Heavy Breakable	21.00-22.00
Malleable	23.00-23.50
Clean Auto Cast	26.00-27.00

Railroad Scrap

Rails, 3 ft. and under	31.00-32.00
Scrap rails	25.00-26.00
Rail Specialties	28.00-29.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$20.50-21.50
No. 2 Heavy Melt. Steel	18.50-19.50
No. 1 Busheling	18.50-19.50
No. 1 Bundles	20.50-21.50
No. 2 Bundles	16.50-17.50
Machine Shop Turnings	12.00-12.50
Mixed Borings, Turnings	10.50-11.00
Short Shovel Turnings	14.00-15.00
Bar Crop and Plate	24.00
Punchings & Plate Scrap	24.00
Cut Structurals	24.00
Elec. Furnace Bundles	20.50-21.50
Heavy Turnings	21.50
No. 1 Chemical Borings	Nom.

Cast Iron Grades

No. 1 Cupola Cast	25.00
No. 1 Machinery Cast	28.00-29.00
Charging Box Cast	26.00-27.00
Heavy Breakable Cast	26.00-27.00
Unstripped Motor Blocks	22.50-23.00
Clean Auto Cast	28.00-29.00
No. 1 Wheels	28.00-29.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$14.00-15.00
No. 2 Heavy Melt. Steel	12.00-13.00
No. 1 Busheling	12.00-13.00
No. 1 Bundles	14.00-15.00
No. 2 Bundles	11.00-12.00
No. 3 Bundles	nominal
Machine Shop Turnings	5.00-7.00
Mixed Borings, Turnings	5.00-6.00
Short Shovel Turnings	7.00-8.00
Punchings & Plate Scrap	19.00-20.00
Cut Structurals	nominal
Elec. Furnace Bundles	19.00-20.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-21.00
No. 1 Machinery	21.00-22.00
Charging Box Cast	18.00-18.50
Heavy Breakable	18.00-18.50
Unstripped Motor Blocks	nom.
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$14.00-15.00
No. 2 Heavy Melt. Steel	11.50-12.50
No. 1 Bundles	12.50-13.50
No. 1 Busheling	10.00-11.00
Machine Shop Turnings	5.50-6.50
Mixed Borings, Turnings	5.50-6.50
Short Shovel Turnings	9.50-10.00
Bar Crops and Plate	16.00-17.00
Punchings & Plate Scrap	16.00-17.00
Chemical Borings	11.00-12.00

Cast Iron Grades

No. 1 Cupola Cast	19.00-20.00
Mixed Cast	18.00-19.00
Heavy Breakable Cast	17.00-18.00
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	19.00-20.00
No. 1 Bundles	21.00-22.00
No. 2 Bundles	17.00-18.00
No. 3 Bundles	14.00-15.00*
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings	15.00-16.00
Cast Iron Borings	14.00-15.00
Bar Crops and Plate	22.00-23.00
Punchings	22.00-23.00
Elec. Furnace Bundles	21.50-22.50
Heavy Turnings	19.50-20.50
Cut Structurals	22.00-23.00

Cast Iron Grades*

No. 1 Cupola Cast	27.00-28.00
Clean Auto Cast	27.00-28.00
No. 1 Wheels	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt	22.00-23.00
Malleable	22.00-23.00
Rails, Rerolling	27.50-28.00
Rails, Random Lengths	22.00-23.00
Rails, 2 ft. and under	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties	24.00-25.00
Angles, Splice Bars	24.00-25.00

* Nominal.

ST. LOUIS

No. 1 Heavy Melt. Steel	$20.00-21.00
No. 2 Heavy Melt. Steel	18.00-19.00
Machine Shop Turnings	9.00-11.00
Short Shovel Turnings	9.00-11.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-26.00
Charging Box Cast	20.00-22.00
Heavy Breakable Cast	18.00-20.00
Brake Shoes	21.00-22.00
Clean Auto Cast	28.00-29.00
Burnt Cast	21.00-22.00

Railroad Scrap

R.R. Malleable	21.00-23.00
Rails, Rerolling	25.00-26.00
Rails, Random Lengths	21.00-22.00
Rails, 3 ft. and under	26.00-27.00
Uncut Tires	20.00-21.00
Angles, Splice Bars	26.00-27.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	18.00
No. 2 Bundles	16.00
No. 3 Bundles	14.00
Machine Shop Turnings	14.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings	15.00
Cast Iron Borings	15.00
Bar Crops and Plate	25.00-26.00
Cut Structurals	25.00-26.00

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Stove Plate	30.00-31.00
No. 1 Wheels	30.00-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable	nominal
Rails, Rerolling	30.00-32.00
Rails, 3 ft. and under	31.00-32.00
Angles and Splice Bars	31.00-32.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings	17.00
Nos. 1 & 2 Bundles	15.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	20.00
Cut Structurals	20.00

Cast Iron Grades

No. 1 Cupola Cast	25.00
Heavy Breakable Cast	20.00-22.00
Stove Plate	25.00
Unstripped Motor Blocks	20.00
Malleable	25.00
Brake Shoes	25.00
Clean Auto Cast	25.00
No. 1 Wheels	25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	22.00
Rails, Random Lengths	22.00
Angles and Splice Bars	22.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	28.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

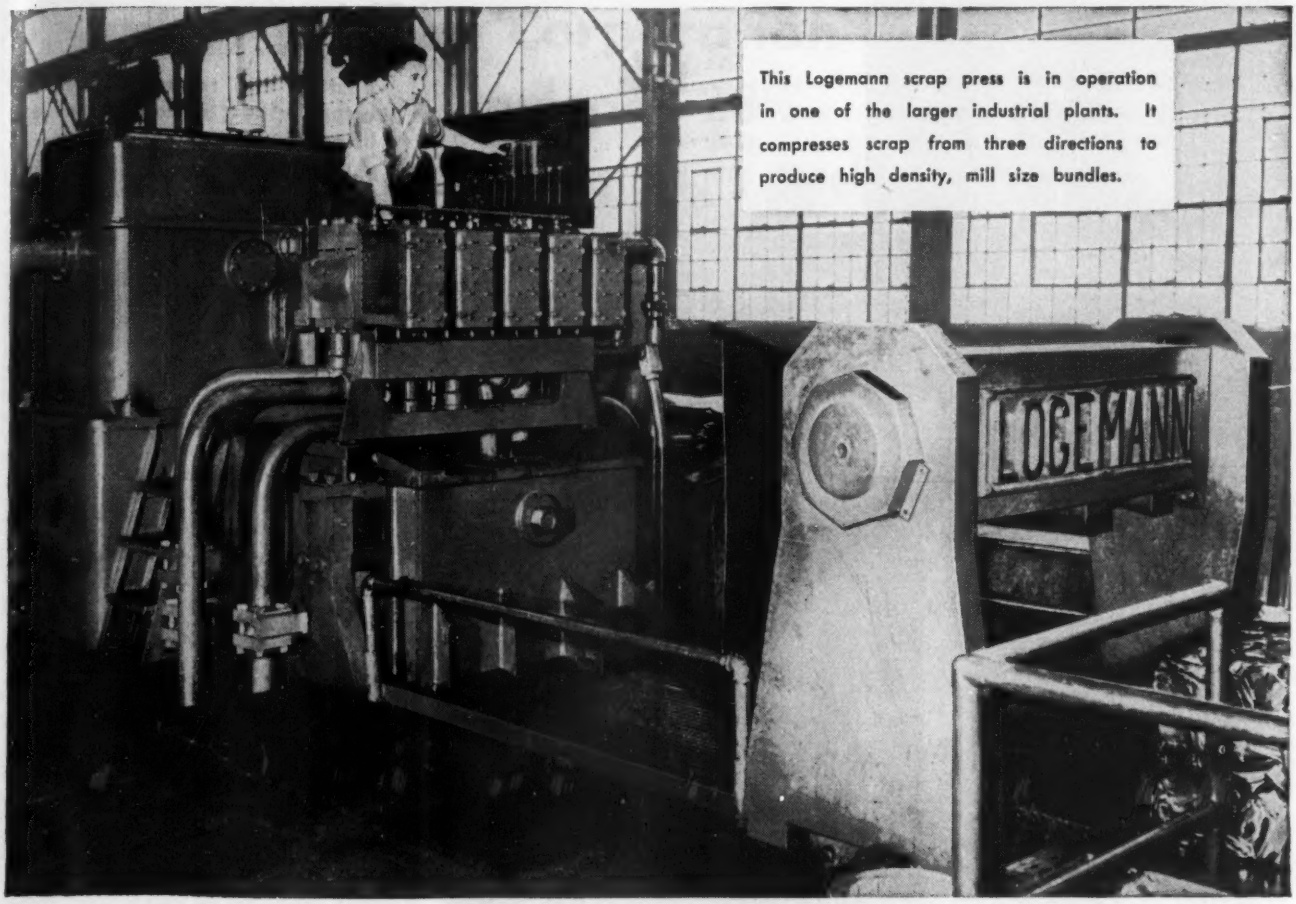
(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00
No. 2 Cast	44.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained.....
Triple Compression..
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost!

LOGEMANN METAL BALERS

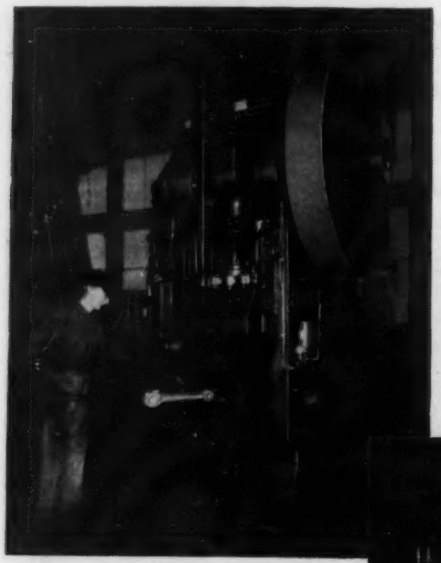
. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

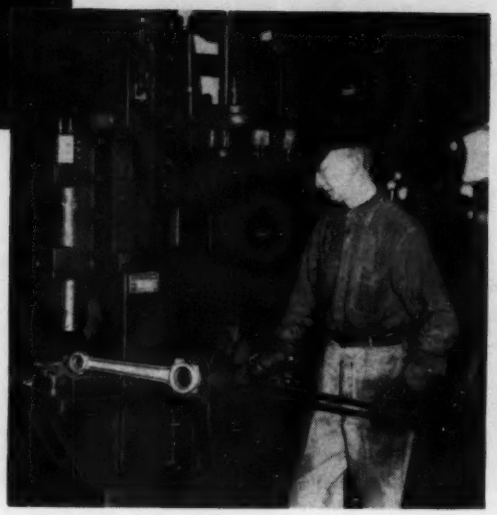
Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin



WELL KNOWN . . .
ALL OVER THE WORLD



WILLIAMS-WHITE
No. 7 Trimming Press
With Outside Trimmer

- Capacity-165 T.; stroke — 6 in.; strokes per minute — 30
- Outer slide has 3 in. stroke
- Main frame — one-piece semi-steel casting
- Flywheel shaft bearings — bronze bushed
- Automatic stop, steel-jaw clutch with treadle control
- Air counter balance
- One-shot lubrication system

The press above is one of a battery of WILLIAMS-WHITE trimming presses installed at Moline Forge, Inc., Moline. The close-up at right shows a connecting rod being finished on the outside trimmer.

WILLIAMS-WHITE & CO. are pioneers in the design and construction of presses, hammers, punches, shears and rolls to meet the particular needs of industry. Each machine is truly custom built to your requirements.

If you are interested in machines similar to the one shown above or any kind of precision production machinery, write us giving as much information as possible and we will send full specifications with no obligation on your part.

MAKERS OF PRECISION PRODUCTION MACHINERY FOR NEARLY 100 YEARS

WILLIAMS-WHITE & CO.
MOLINE, ILLINOIS

Plates . . .

Plate Prices, Page 153

Eastern mill reduces prices $3 a ton further. Export quotas are lifted

Philadelphia — Continued slackening in demand has resulted in a further decline in district plate mill operations. All steelmaking operations have been down for more than a week at one mill and two open hearths have been taken off at another, for the first important reduction at this latter mill this year. Still another open hearth at the latter may be taken off shortly. Meanwhile, most mills can still accept tonnage for rolling this month.

The Claymont, Del., producer has made a second reduction within recent weeks on plain carbon plates, the latest revision amounting to $3 a ton and bringing the price down to 3.50c per pound, Claymont, as of June 1. This change established a new minimum delivered price on plates at Philadelphia of 3.5848c. The Claymont producer has made no change in the 3.45-cent price established a few weeks ago on plates scheduled for extra processing in the mill's flange shop. Standard extras in all cases will be applicable.

Boston—Plate demand has dwindled to near prewar levels. While buying policies approach patterns of that period, the recent drought in supply, former premium prices and advent of f.o.b. mill pricing have raised problems in readjustment of distribution. Some mills normally supplying a good part of tonnage to this area completely revised their selling policies in recent years. While certified allocations played a part in this, some became selective, gave up bread and butter volume and lost or gave away old time accounts. This is now completely in reverse.

Philadelphia — While galvanized sheets are still the most scarce item on the list, at least one large producer can promise reasonably early deliveries on heavy gages, with space still available for July rolling. He expects to be in good position on the light gages by mid-summer.

Pittsburgh—Recent reductions in ingot operations at Carnegie's Pittsburgh mills are attributed in part to catching up on order backlogs of plates and standard shapes. Railroad needs for several months have been only a fraction of former requirements, while demand from such sources as barge construction, presses and other heavy industrial equipment has receded substantially in recent weeks.

Birmingham—Receipt of even a moderate volume of freight car orders this week has further tightened plate supply. Business in plates is coming from a variety of sources, including tank producers, shipbuilding and ship repairs. But it aggregates a sufficient volume to account for full production here and at Gadsden, especially since so much of the Gadsden tonnage is going into pipe output.

Los Angeles—Consolidated Western Steel Corp. has received a contract from Pacific Gas & Electric Co. to fabricate nearly 200,000 tons of 34-

Hughes-Keenan Corporation Increases Truck Payloads 20% with J&L OTISCOLOY high-strength steel

J&L STEEL

(Above) *Spot-welding a truck roof-reinforcement and bow assembly, made of* J&L *Otiscoloy steel, at the Hughes-Keenan Corporation, Delaware, Ohio. Both the panel and bows are cold formed.* (Left) *Truck bodies on the Hughes-Keenan assembly line.*

Builds stronger, longer-lasting truck bodies with less steel

Eliminating 20% of the deadweight from milk truck bodies is not the only advantage in using J&L Otiscoloy high-strength steel, according to Hughes-Keenan Corporation, Delaware, Ohio.

For good sanitation, milk truck bodies must have their interiors steam-cleaned every day. Moisture from melting ice refrigeration during milk delivery is always present. Normally the continuous wetting and drying would cause rapid corrosion in a milk truck body made of mild steel.

Otiscoloy resists rust four to six times as effectively as mild steel. This pays off to the truck owner in longer service life. And it pays off to Hughes-Keenan Corporation in having a better quality, lighter, longer-lasting truck body.

The quality in these truck bodies does not entail added production costs. Although high-strength steel is more expensive than mild steel, Otiscoloy is used two gauges lighter with equal or greater strength than ordinary mild steel. Four sections can be made from Otiscoloy where only three sections of equivalent strength could be made from the same weight of mild steel. More units are produced per ton, freight costs are reduced, units are lighter, easier to handle during production.

Otiscoloy is recommended for applications where strength without bulky weight is desired—also where corrosion, abrasion and fatigue are problems in the service life of equipment.

Otiscoloy can be formed hot or cold, welded, forged, flame-cut and otherwise worked by standard methods. Here is a *modern* steel that is worth *your* investigation. Why not return the coupon to us today?

Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me at once a copy of your booklet, "Otiscoloy High-Tensile Steel."

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L *manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY (*hi-tensile steels*).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Remove up to 6 cu. ft. of Cast Iron Per Tool Grind on Modern Planers

Kennametal Mechanically-Held Assembly Provides Outstanding Sturdiness; Permits Fullest Use of KENNAMETAL
Improved Shockproof KENNAMETAL K1 Withstands Heavy Cutting Pressures and Cratering Action of Modern Types of Cast Iron

Strong, Durable, Clamped-on Kennametal Planer Tools... Make Heavy-Duty Planing Practicable

Now you can take heavy roughing cuts at high speeds (100-250 ft/min) on any of the newer type planers having a tool lifter. Clamped-on Kennametal Planer Tools make it practicable . . . and *profitable*. They remove metal at a faster rate—keep machine down time to a minimum—reduce tooling cost per piece —minimize grinding time and confusion.

Yes—you need a good, rigid, properly-powered, correctly-adjusted planer. And you *must* have a strong, shock-proof, thermal-strain-free carbide tool that can take a beating and like it. Here's where the uniformly sound structure of mechanically-held Kennametal K1 pays off. Read these typical performance reports:

"Kennametal Planer Tools remove 6.5 cubic feet of semi-steel per tool grind." "5 cubic feet of 180 Brinell cast iron removed per grind." "6 cubic feet of 180 Brinell cast iron removed per grind."

Our field engineers can help you apply this cost-cutting Kennametal tooling to your planing operations. Ask them to do it. And keep in mind—the cemented carbide that has the strength and durability to do tough roughing jobs on planers successfully is the carbide that can cut tooling costs on *all* your milling, boring machine, and lathe work. That's Kennametal.

KENNAMETAL® *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTION

inch pipe for a gas line running from Needles, Calif., to San Francisco. Production will begin early in June, with part of the pipe to be fabricated here and the remainder at Consolidated Western's plant in San Francisco. Majority of the plate is to be supplied by Geneva Steel Co., Geneva, Utah.

Seattle — With materials in improved supply, plate fabricators report business slow and confined mainly to small contracts for pipe and tanks. Several sizable jobs are pending for Columbia Basin and Alaska military installations.

Tubular Goods . . .

Tubular Goods Prices, Page 153

Boston—Tubular products, in tight supply until recently, including seamless 3½-inch and under, are easing; while restrictions on boiler tube allocations are giving ground. Distributors have a smaller volume of business and some are not taking in much tonnage for June and July; withdrawal of consigned stocks makes secondary sellers more sensitive to inventory and buying. Part of this district's mill quotas, notably on butt weld, are being turned back. Warehouses are taking in less mechanical tubing than is being allocated and there is some revision of old orders. That lead time schedules are weakening is indicated by the booking of some June tonnage on three to four-week delivery.

Pittsburgh—Slump in demand for mechanical tubing, which developed early in February, has spread to pressure tubing within last two weeks. Sellers have abandoned mill allotment distribution pattern of mechanical tubing for some months now, but only recently took similar action in opening books for third-quarter delivery. Sale of boiler tubes to jobber account has similarly been eased in that the distributor is now permitted to purchase items for direct shipment to boiler manufacturers.

Babcock & Wilcox Tube Co. discontinued incorporating in its base prices a standard boiler tube specification extra, equivalent to 10 per cent of base price, on hot and cold-drawn tubing, effective May 9.

Los Angeles—Pipe and equipment specifying by the petroleum industry has increased substantially and is now at the best level in recent months. A large portion of the buying is going into drilling rigs and machinery for oil exploitation. One fabricator of equipment has received six large orders in the past two weeks, more than this firm had booked in months. Extensive programs now are under way for oil exploration in Central and South America, and equipment needs for these projects will be considerable.

San Francisco—Small diameter pipe is in ample supply and is moving slowly. Large diameter pipe, however, is tight and is still greatly in demand for pipeline projects.

Seattle—Cast iron pipe agencies report some cancellations. Demand has slowed perceptibly with deliveries speeded. Inventories have been replenished. No important projects are out for figures.

Steel Bars . . .

Bar Prices, Page 152

Chicago—Users are closely following the practice of ordering steel for orders actually in hand, there being very little disposition to stock steel against the possibility of a work stoppage in the producing industry. Such buying habits are making it very difficult for most mills to predict their operations much beyond July, although local producers' June schedules appear completely filled. Easing in carbon bar supply has been most pronounced in smaller sizes, generally ranging upward in stringency to the largest sizes, this being in marked contrast from the situation generally prevailing late last year.

New York—Although there are fewer cutbacks and consumer inventories are less heavy, hot carbon bar sellers are still eating into backlogs, with a result that some remain in a position where they can make limited shipments before the end of this quarter against new orders. However, they will be able to maintain a good rate of operations throughout the current month, although not as high as for May. Specifications for July are coming in more freely, even though sellers expect that vacations at various consuming plants will restrict needs to a lower level than in June. Cold-drawn carbon bar demand still tapers, with sellers looking for little improvement before late summer or early fall.

Boston—With most bar consuming industries operating at lower levels, several sharply off from peak, including forge shops, forward buying is slack with July schedules unfilled. Lead-time scheduling is more elastic as deliveries improve on carbon bars with users placing spot orders after normal dead-lines are reached. Cold finishing mills are curtailing production further and have eased pressure materially on hot-rolled stock. Volume on mill books for early next quarter has been subject to revision as to sizes and grades; substitutions have disappeared with consumers now getting what is required in way of specifications. Alloys can be shipped in four to six weeks.

Wire . . .

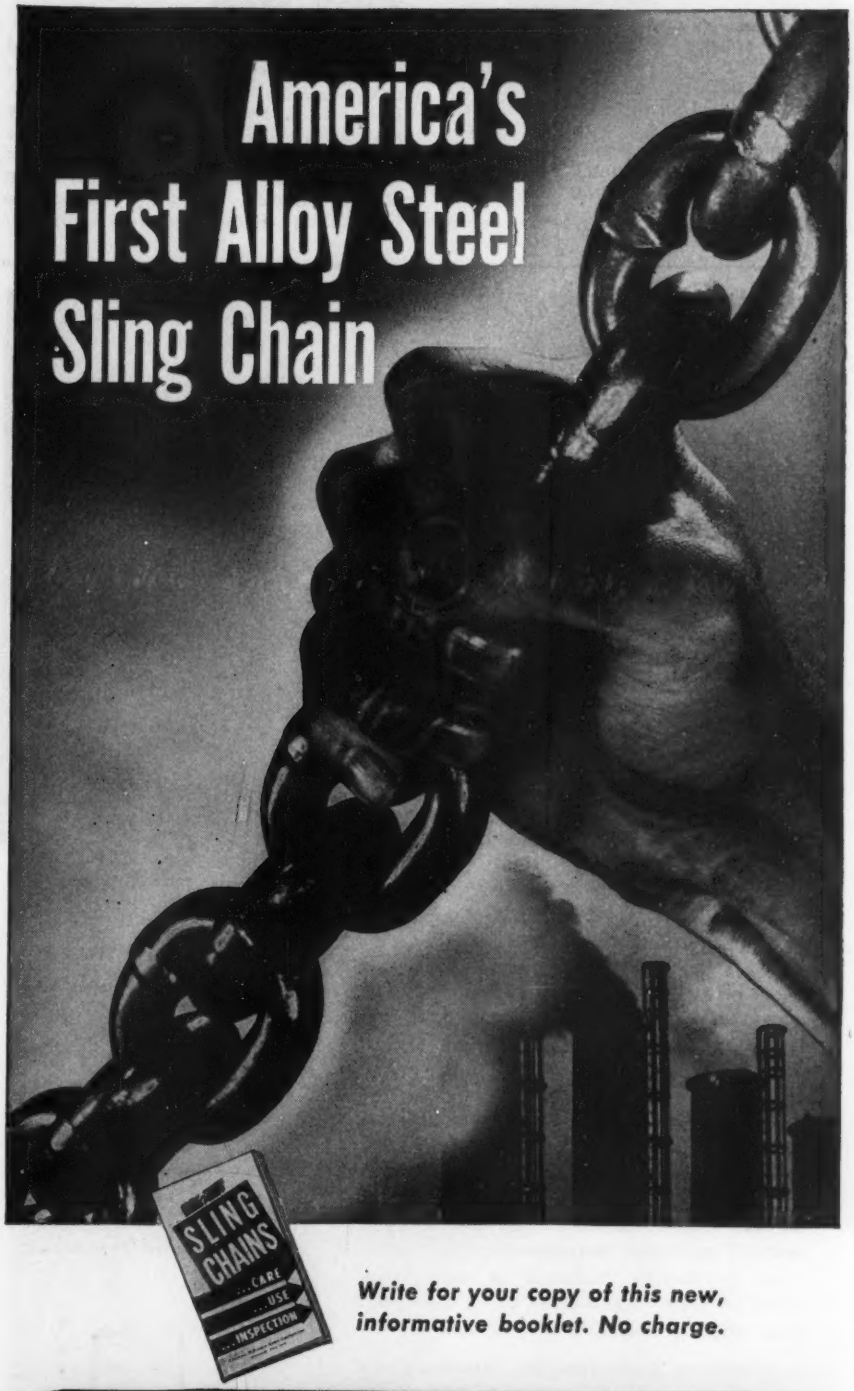
Wire Prices, Page 153

Pittsburgh — Portsmouth Steel Corp. has reduced wire product quotations to competitive base price levels and has adjusted downward galvanizing extras on manufacturers' wire. This action represents a reduction of $2 a ton on merchant quality annealed and galvanized wire, woven fence, barbed wire, bale ties and nails. The company's type 3 galvanizing extra on manufacturers' wire, 6 to 9 gage, is now $1.40, a decline of $1.15.

Boston—Demand for wire sags with slack in forward buying pointing toward sluggish third quarter. All major wire products are adversely affected, but to a lesser extent on automotive specialties. Buyers are inclined to ignore lead-time schedules, operating off inventory and getting prompt delivery on most fill-in requirements. Selective selling has disappeared.

New York—While a few releases

CM HERC-ALLOY



Write for your copy of this new, informative booklet. No charge.

COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: NEW YORK, CHICAGO, CLEVELAND AND SAN FRANCISCO

against suspended orders are noted, indicating some consumers cutback too drastically, wire demand in general is slow. Users are living off inventories to large degree. Spring requirements are light.

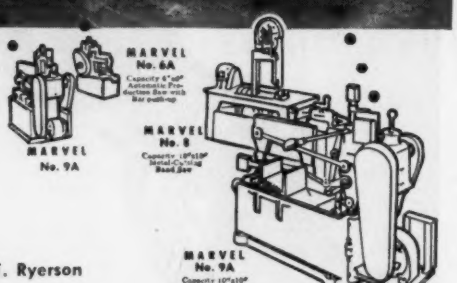
Chicago—While plain wire requirements continue to drift lower, certain specialties are in strong demand here. Seasonally, welded mesh is desired in greater quantities than can be produced. However, doubts exist as to whether this strength will continue to be shown next quarter. Wire rope demand is also holding up well. Certain types of nails continue in short supply, but are gradually moving into balance with demand.

Birmingham — Demand for wire products is holding up remarkably well. Considerable buying is being done by agricultural interests which have stepped up their program of general repairs with the advent of favorable weather. Nails and woven fencing are comparatively tight.

Alloy Steel . . .

Cleveland—Reflecting the reduced demand for alloy steels, mills are increasingly interested in smaller orders. This trend is being felt by warehouses, to which the small-order business normally would go. There is no forward buying of alloys, much of the current ordering being done to balance out materials on hand.

capacity for . . .
"Cut to length"
SERVICE!



This recently enlarged, giant, Joseph T. Ryerson & Son, Inc., steel warehouse has cutting-off capacity to give fast service on any conceivable volume. Equipped with one Series 6A MARVEL Automatic Production Hack Saw, four Series 9 MARVEL High Speed Hack Saws and a No. 8 MARVEL Band Saw, the warehouse can deliver single or literally thousands of cut-to-length pieces on short notice—pieces cut to order from bars, tubes or shapes.

MARVEL-cut pieces from this warehouse will be accurately and squarely cut. It always pays to buy steel from MARVEL equipped warehouses.

Above: One cutting-off department of the Joseph T. Ryerson & Son, Inc., steel warehouse at Philadelphia.

see our CATALOG in SWEET'S FILE

MARVEL Metal Cutting SAWS
Better Machines—Better Blades

Armstrong-Blum Mfg. Company
5700 W. Bloomingdale Ave. Chicago 39, Illinois

Sheets Strip . . .

Sheet Prices, Page 152

New York—Most sheet sellers are in fairly good position on the major grades for the next two months. They have little to offer for June, except that which may result from cancellations or deferments; recently, there have been few cancellations or deferments, so that not much tonnage is likely to be freed for these reasons. July bookings are now mounting more rapidly, with a result that producers are no longer much concerned about business in that month, especially those who are contemplating time off for vacations. However, there has been little buying so far for August, except in galvanized sheets which continue tight. Some mills feel a little more optimistic over the outlook for the next few months than they did recently, due to the fact there are fewer cancellations and deferments and that stocks at various consuming plants are being reduced, even though gradually.

Pittsburgh — Automotive builders and suppliers are the lone remaining active sources for new sheet and strip orders involving significant tonnages, and it is questionable how long this industry can maintain present assembly schedules. Demand for heavy trucks, electrical appliances and other consumer groups continues depressed. No improvement in this situation is indicated until early fourth quarter by some trade authorities. Decline in demand for silicon and enameling sheets has been most pronounced. Output of galvanized and plain hot and cold-rolled sheets has been fairly well sustained to date at expense of order backlogs. Rolling schedules also may be adversely affected by easing in tin plate requirements. Sellers expect production low point on sheet and strip to be reached in August.

Boston — On cold-rolled carbon sheets, some July mill schedules are filled, but beyond that month commitments are light. Backlogs of cold-rolled strip are melting and less tonnage is available to bolster schedules. Third quarter is likely to be slowest in years.

Philadelphia—Cold-rolled sheet supply is still tight, but is easy compared with that of several weeks ago. Some consumers can obtain tonnage within six weeks and upon occasion even in less time, depending upon how fortunate they are in running into a spot opening at a mill resulting from some deferment or cancellation. However, most mills have relatively little to offer through July. All appear to be able to do better on hot-rolled sheets than on cold.

Cleveland—A leading carbon sheet producer has announced August allotments for its districts. This producer reports carbon strip is now in tighter supply-demand relationship than are sheets. Stringency in cold-rolled carbon sheets is more pronounced than that in hot-rolled. Galvanized sheets remain in strong demand. Requirements for silicon are weak. Several home appliance manufacturers have resumed limited purchasing of flat-rolled steel.

Cincinnati — Demand for sheets, especially cold-rolled and galvanized,

continues substantial. However, level of production beyond July, based on present inquiries, is not discernible. Buying of electrical sheets is slow. Needs and output of enameling sheets seem in balance currently.

Birmingham—Although it had been expected that demand for sheets would have materially declined by now, the exact opposite is true. There still is not enough sheet tonnage to meet requirements. That is not too surprising, however, when it is considered that sheets have led the parade here for years as far as demand is concerned.

St. Louis—Demand for cold-rolled sheets continues to soften, but not sufficiently to force curtailment of output. Granite City Steel Co.'s open-hearth output has been cut 50 per cent, probably for most of June, due to repairs to the runout table of the slab mill. Capacity operations will be resumed, however, when repairs are completed. Principal mainstay for demand in this area is galvanized sheets and tin mill products, which are booked solidly through the third quarter. Fourth quarter bookings are not being accepted. Prevailing opinion in this district is that the larger mills will be down to 80 per cent of capacity by the year-end.

Los Angeles—Demand for sheet has stabilized at the level established about 30 days ago. Although there is somewhat more spottiness in the needs of various outlets, overall requirements are about the same. Light gage galvanized continues in strong demand, with supplies extremely short. Seasonal needs of fabricators of home cooling systems now are at a peak, with most of these makers unable to obtain as much galvanized as they need.

San Francisco—Buying doldrums continue in most flat-rolled items and supply and demand are virtually in parity. Many consumers are still hopeful of price reductions before autumn and have no intention of increasing orders until the price trend becomes clearer. Business of most fabricators continues depressed.

Structural Shapes . . .

Structural Shape Prices, Page 153

New York—While various projects are undergoing preliminary figuring, few are in an active stage and awards generally are spotty. Moreover, most jobs are still of public character, and it appears that work of this type will continue to constitute the backbone of structural demand for some time to come.

Through typographical error, April structural contracts were reported in last week's issue as involving 79,546 tons. The correct figure should have been 97,546 tons, as was originally received from the American Institute of Steel Construction.

Boston—Deliveries on fabricated structural steel continue to improve with prices easier under pressure of competition. District shops promise six to eight weeks on smaller tonnages while larger fabricators promise one month to six weeks earlier shipment than they did two months ago. Bridge inquiry is limited to small tonnage projects, which for Connecticut total 425 tons.

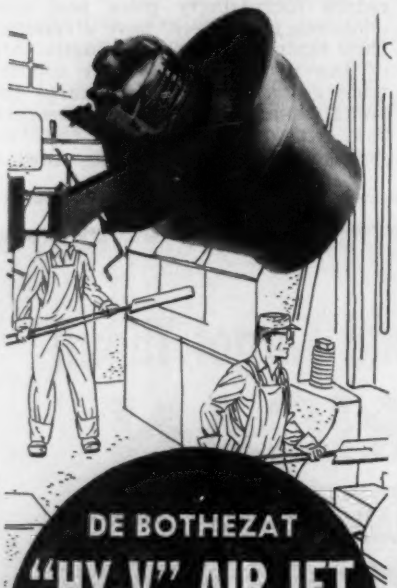
Pittsburgh—With relatively prompt deliveries on standard structural shapes now available from the mills, fabricators are now specifying to more exacting size basis to meet requirements of specific jobs bid. Return to this prewar buying method results in considerable economies for fabricators because of the elimination of cutting sections to required lengths, etc. Reluctance of fabricators to order well ahead as in past also is reflected in fact third quarter mill specifications are filling slowly.

Philadelphia — Structural inquiry continues to be comprised principally of public work, including new four sections for the Pennsylvania state turnpike. Backlogs at district fabricating shops reflect a further drop in demand, and shape supply is steadily easing. Operations at the Phoenixville, Pa., mill remain suspended.

Chicago—Further indication that the need for quotas on steel products is fast drawing to an end was given last week by the disclosure by one local shape producer that wide flange beams will be available to all comers in third quarter. Slackening construction activity is making fabricators increasingly price and cost conscious and several have diversified their business to include manufacture of heavy components on a subcontract basis. While by and large the trend among consumers is down, a few light structural users have increased their requirements. One, a

Install Them and Forget Them!
AMERICAN
RADIAL
Roller Bearings
AMERICAN RADIAL ROLLER BEARINGS are engineered to exacting standards that result in better performance and minimum maintenance.
Furnished in 5 styles, 6 S.A.E. series and 35 sizes. Special designs also available. Write.
AMERICAN
ROLLER BEARING CO.
420 Melwood Street Pittsburgh, Pa.
Pacific Coast Office:
1718 S. Flower St., Los Angeles, Calif.

Reduce HEAT FATIGUE! Increase EFFICIENCY!



DE BOTHEZAT
"HY-V" AIR JET
blows a stream of cool air to hot spots without using ducts!

This extremely efficient man cooler is particularly adapted for reducing fatigue of workmen exposed to radiant heat. "Hy-V" Air Jets project a concentrated stream of cooling air as far as 35 feet without the use of ducts. Available with bracket for wall mounting or equipped with portable wheeled stand. Investigate the advantages and economy of "Hy-V" Air Jet ductless cooling in your plant TODAY!

WRITE FOR FREE CATALOG!

DEBOTHEZAT FANS DIVISION, Dept. T-6
American Machine and Metals, Inc.
EAST MOLINE, ILLINOIS
Without obligation, send me new illustrated catalog on "Hy-V" Air Jets.

Firm
Address
City Zone
State
Sender's Name

maker of materials handling equipment, recently pushed its operations to a 50-hour week basis because of the heavy volume of new orders received when a new model was introduced.

San Francisco—Public construction is the mainstay of structural products as private building continues to ease. Supplies of most items are relatively plentiful.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 152

New York—Improvement in supply of reinforcing steel is developing as more semifinished becomes available. Contractors with storage facilities are better supplied with building materials than expected.

Seattle—Wage negotiatinons with Northwest Steel Rolling Mills Inc., Seattle, were under way last week and in view of the situation no new business was being booked, efforts being concentrated on getting out pending contracts.

Revisions in Freight Rates

Boston—To hold traffic in rail service, downward revisions in freight rates on several important steel products and coke between points in this area have been initiated by New England territory railroads.

On steel wire a rate of 23.50c to replace 26.00c from Branford, Conn., to Holyoke, Mass. is proposed; galvanized, acid coppered, painted, plain or tinned, including barbed wire, or brass, bronze, cadmium or copper coated are involved with the minimum rate reduced to 30,000 pounds from 40,000.

From Phillipsdale, R. I., freight of $2.75 per gross ton to Forestville, Conn., will replace former charge of $3.43 on steel bands in coils, unfinished, not drawn through a die, which can be transported in open cars without damage from weather.

Leaded brass billets from Bridgeport, Conn., to Scotia, N. Y., formerly carrying a freight rate of 48.00c per 100 pounds will be reduced to 26.50c, minimum weight 100,000 pounds.

Bars or rods from Wallingford, Conn. to New York harbor lighterage points, formerly 33.00c, goes to 32.50c with the minimum rate 30,000 pounds instead of 36,000 pounds.

From New Haven, Conn., to various Connecticut points, freight rate on coke, coke breeze, dust and screenings is reduced from 14.00c per short ton through a range to 55.00c.

Rails, Cars . . .

Track Material Prices, Page 153

New York—Award of 200 covered hopper cars by Southern Railways to the Pullman-Standard Car Mfg. Co. recently is the first sizable list to have been placed with a commercial car shop in some time and leaves nothing of importance in the way of freight cars actively pending. Some car shops have virtually cleaned up their backlogs and others see the end in sight by early fall unless inquiry takes a turn for the better.

KLEIN CUTS COSTS with Correct CUTTING FLUIDS

MATHIAS KLEIN & SONS, Chicago, selected cutting fluids for machining high carbon vanadium steel forgings for the well known Klein pliers on a basis of competitive tests. When using D. A. Stuart's Solvol, tool life was more than double that secured by the best of several products tested.

With a 20 to 1 dilution of Solvol, side broaching is at the rate of 28,000 pieces per grind. Drilling, reaming and countersinking are done at the rate of 650 pieces per hour with a 30 to 1 dilution of Solvol.

The increase in tool life and production and the satisfactory finish secured with Solvol on this job are excellent examples of the cost cutting opportunities possible by using the best cutting fluid for the job. In buying cutting fluids it is *wise economy* to figure production costs rather than cutting fluid price. Write for booklet, *Cutting Fluids for Better Machining.*

STUART *service goes with every barrel*

D. A. Stuart Oil Co.

2735½ South Troy Street, Chicago 23, Ill.

Pig Iron . . .

Pig Iron Prices, Page 154

Pittsburgh—Demand for merchant foundry iron remains at lowest level in postwar period and there is little indication of a significant turn for the better throughout June because inventories of enamelware and radiation items continue out of balance in relation to current requirements. Price reductions on job casting work have not generated expected improvement in new order volume. Many jobbing foundries are closed or are operating on a 2 to 3 day per week schedule. Some increase in merchant iron demand is noted among larger captive foundries.

Boston—Pig iron producers are beating the bushes for orders with slight success. There are additional curtailments and foundry closings with no improvement in June releases in sight. Although some sharp reductions in prices of castings have been registered, little response in way of new volume for foundries is noted.

Philadelphia—Downtrend in pig iron demand continues. One eastern producer estimates that his shipments in May were off about 25 per cent from the preceding month and off about 50 per cent from March. A further but less pronounced decline is expected this month, cushioned perhaps by some protective buying due to threat of labor disruption in coal and possibly also in steel. The Chester, Pa., furnace recently blew out, with an estimated reserve of about 20,000 tons of iron on hand, most of it basic.

The Navy is closing bids June 13 on 300 tons of foundry iron for Washington.

Cleveland—No improvement in demand for pig iron is expected before September. As business tightens up, companies with captive foundries continue to withdraw their patterns from jobbing shops. Some jobbing foundries are shading their castings prices downward to attract business. Jones & Laughlin Steel Corp. has blown out one furnace here for relining.

Buffalo—Shipments of merchant iron in this area for the second quarter are running at about half of the volume for the previous quarter. Demand for iron is falling further behind production as iron is moving out of the area or into storage. At least one producer believes the drop in foundry operations will level off shortly. Inventory stocks of most foundries are low. While most melters are operating on a sharply reduced level, motor and agricultural casters are maintaining active schedules and are the chief support of the industry at present. Large quantities of Swedish ore are moving into the local area. The Bethlehem Lackawanna plant plans to shut down its "A" stack for relining. Republic transferred one of its two stacks at the Buffalo plant from basic to merchant iron.

Cincinnati—The foundry melt in this district is unimproved, and there is some basis for belief there will be no pickup before late summer. Some foundries may take early, and perhaps prolonged, vacations. Trimming of prices on castings is reported, with introduction in the market of re-

For Use In:

FOUNDRY
COKE DEPT.
STRIP MILL
STORES DEPT.
TOOL WORKS
OPEN HEARTH
SCRAP YARDS
MACHINE SHOP
ROLLING MILL
FORGING PLANT
BLOOMING MILL
MAINTENANCE DEPT.
CONSTRUCTION DEPT.
COLD-DRAWN BAR MILL

COMPLETE MATERIALS-HANDLING SERVICE

KRANE KAR swings load to either side

KRANE KAR is a lively swing-boom mobile crane, gas or diesel operated, of compact dimensions, short turning radius. It transports any load it can lift. Put it to work in any part of your plant, yard, or stores; it will speed up production, cut down handling costs. Available for service 24 hours a day, every day.

9 to 37 ft. booms or adjustable telescopic booms. Electric magnet, clam-shell bucket, and other accessories available. Write for Bulletin No. 79.

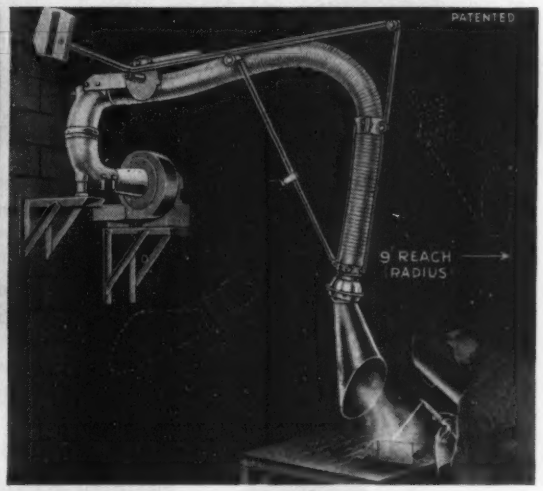
THE ORIGINAL SWING-BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER
1¼, 2½, 5, AND 10 TON CAPACITIES
KRANE KAR

Mfrs. of Car Movers, Winches, Truck Cranes, etc.

SILENT HOIST & CRANE CO., 849 63rd ST., BKLYN 20, N.Y.

RUEMELIN Fume Collector

(Above) Welding without ventilating snout. Note smoke clouds and poor vision. Gases and heat surround operator's helmet.



(Right) Collecting fumes with a Ruemelin Fume Collector.

REMOVES WELDING FUMES at the Source!

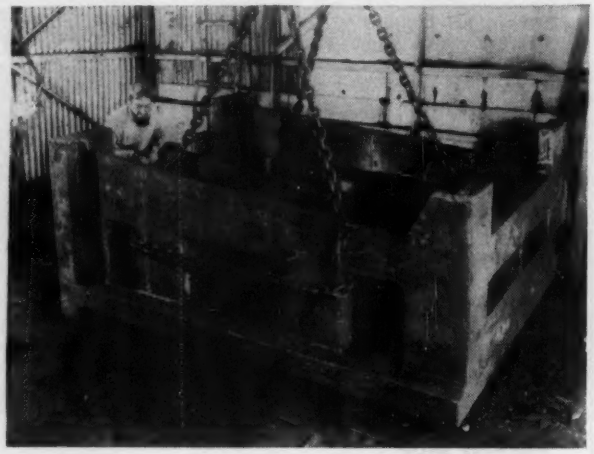
Solve your welding fume problem efficiently by installing Ruemelin Welding Fume Collectors. They produce a powerful suction that removes smoke, gas and heat at the source. Guards employee health, resulting in less welder fatigue. Clears shop air with minimum heat loss. Covers maximum welding area vertically, horizontally and by circle swing. Made in 9 ft. and 15 ft. reach sizes. Shipped assembled, easy to install. Thousands in practical service. Free engineering service for your installation.

Write for our New Bulletin 37-D and list of users — just off the press.

RUEMELIN MFG. CO.
MANUFACTURERS AND ENGINEERS
SAND BLAST AND DUST COLLECTING EQUIPMENT
3882 NORTH PALMER STREET • MILWAUKEE 12, WISCONSIN, U. S. A.

A 5580-⅛R

WHAT'S THE FINISHED COST?



In relation to the cost of machining this 18½-ton angle plate, a little difference one way or the other in the price of the casting itself is of small consequence. The chief consideration is the character of the casting—whether it will require the maximum or minimum of finishing.

If a sound, accurate casting costs more, it is worth more because of the savings in the machine shop. On the contrary, a distorted and defective casting entails so much extra finishing cost that it is expensive at a ridiculously low price.

Advance Castings are bought by customers who think in terms of the finished product. Yet they are keenly aware of casting prices and carefully check our quotations. They pay us only what they think Advance Castings are worth—and our business continues to grow.

If you are interested in custom castings that are really economical, we'd like to talk to you.

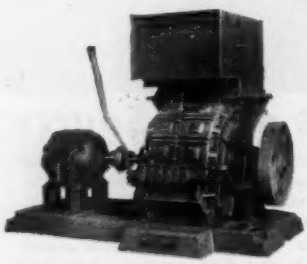
ADVANCE CASTINGS THE ADVANCE FOUNDRY CO. DAYTON 3, OHIO

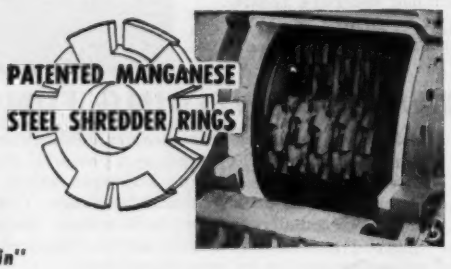
STRENES METAL • ALLOY GRAY IRON • GRAY IRON

YOUR METAL TURNINGS ... OR A PROFIT?

The rapid reduction of long, curly, hard-to-handle turnings into short shoveling chips with Americans solves handling and storage problems. The low cost at which Americans operate makes their installation highly profitable. The yield of cutting oil is increased 30 to 50 gallons per ton. Alloy steel, carbon steel, aluminum, brass, and bronze turnings are reduced to uniform chips by Americans in capacities from 1 to 10 TPH

Only Americans have shredder ring action that assures uniform chips and prevents clogging and stalling.





Send for "Metal Turnings Bulletin"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1539 MACKLIND AVE.
ST. LOUIS 10, MO.

quests for bids. A seasonal tapering in pig iron requirements for agricultural machinery, which have been held comparatively high, is due.

Chicago—District iron melt shows little fluctuation from week to week, two, three and four-day operations in jobbing foundries being the rule, except for those with automotive and farm implement accounts. Iron sellers have lost much of the optimism they felt in the spring, and on the basis of recent shipments against known casting production many in the trade feel that inventories are still being worked off and new buying will be extremely light until these are further reduced. Inland Steel Co. recently switched one stack to spiegeleisen in a campaign which will last until mid-July.

Birmingham—Demand for pig iron, while considerably weaker than a few weeks ago, shows moderate signs of strengthening. Merchant iron melters do not believe a prolonged drought is in prospect and anticipate considerable improvement as inventories are worked off.

St. Louis — Reflecting a further drop in orders and an increase in cancellations and holdup instructions, Koppers Co. here banked its "A" furnace last week, cutting pig iron production to 60 per cent of capacity. Ground stocks are ample to supply anticipated customer needs during June, officials said, and the furnace was banked, rather than blown out, in anticipation of a July pickup in business. Coke ovens have been cut 13.3 per cent which, with the elimination of the normal 20 per cent outside purchases, trims Koppers coke use by one-third. Four weeks ago Koppers curtailed output 15 per cent, with the expectation of going no lower than 75 per cent of capacity. However, indirect effects of the Ford strike began to hit here ten days ago and offset a trickle of new buying by customers who at last had worked off excess iron inventories.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 154

Pittsburgh—Leading consumer of beehive furnace coke has been out of the open market since middle of May, which would indicate that its stock position in relation to indicated demand is more than adequate. Some sellers still have commitments to carry them through June at prices within the $13.50 to $15.50 per net ton for Connellsville beehive furnace coke. Moreover, as in case of beehive foundry coke, there is no new buying of consequence. Price weakness has developed in beehive foundry coke with present quotations of $16 to $16.50, off $1 from higher side of the range.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 155

Pittsburgh—Substantially reduced production schedules of 3 to 4 days per week continue in effect among producers. In most instances, operations are based entirely on new order volume, order backlogs having been depleted within recent weeks. A growing number of items are promptly obtainable from stock.

Scrap . . .

Scrap Prices, Page 158

Philadelphia—Further weakness has developed in scrap. No. 1 heavy melting steel is now $20.50-$21.50, delivered; No. 2 heavy melting steel and No. 1 busheling, $18.50-$19.50; No. 1 bundles, $20.50-$21.50; No. 2 bundles, $16.50-$17.50.

Machine shop turnings have been reduced to $12-$12.50; mixed borings and turnings, $10.50-$11; short shovel turnings, $14-$15. Bar crop and plate, punchings and plate scrap and cut structurals are now holding at $24, delivered; electric furnace bundles and heavy turnings, $20.50-$21.50.

Leading pipe makers recently bought No. 1 cupola cast at $25, thus establishing a new low on this grade. No. 1 machinery cast is unchanged at $28-$29. Charging box and heavy breakable cast grades have declined to $26-$27 and No. 1 cast wheels to $28-$29.

Pittsburgh—Purchases of scrap remain restricted to "token" tonnages, principally to maintain supply lines and to act as a stabilizing factor. Small lot purchase of No. 2 heavy melting steel at $21 was made recently; No. 2 bundles, at $19; short shoveling turnings, at $18. The market continues devoid of action for cast scrap grades. Since old orders have largely been cleared up, abnormal price differential for railroad items over those originating from industrial sources is expected to be narrowed on this week's awards. Bids for No. 1 railroad heavy melting have been lowered $2. Export of scrap is increasing, notably from southwest areas to Mexico.

New York—Brokers have reduced their buying prices on No. 1 heavy melting steel and No. 1 bundles to $14-$15, f.o.b. shipping point. They have also reduced No. 2 bundles to $11-$12. The situation generally is dull with few indications of early improvement.

Cleveland—Further weakness appeared in scrap last week. Some shipments are going into the Valley. Demand for foundry grades is light. Shrinking of demand for low phos pushed prices on that item down $1.50 to $2.50. Cut structurals fell a like amount. Prices on cast grades were down $2.

Buffalo—Additional scrap price declines of 50 cents to $1 a ton were posted last week on limited tonnage sales to a leading mill. Orders were placed within a range of $18.75 to $19.25 a ton for No. 2 heavy melting while No. 2 bundles were down to $16.75-$17.25. Weakness continued to pervade the market as dealers generally extended their search for bids. Augmenting the bearish side of the market for dealers was the continued movement of scrap by water, both from the eastern seaboard via the canal and from lake ports.

Cincinnati—Although scrap quotations are considered nominal, those for open-hearth grades are fairly stable. A disturbing market factor may be the large tonnages being offered on railroad lists and by some fabricators. Some buying is being done, but in small tonnages, and some estimates place the decline in ship-

LOST!
3 BILLION DOLLARS EVERY YEAR

The annual toll taken by the elements that cause rust and corrosion is staggering. How much of this are you *needlessly* paying in costly replacement and maintenance *because you didn't* provide protection for exposed installations and equipment?

Hot-Dip Galvanizing Seals in the Base Metal

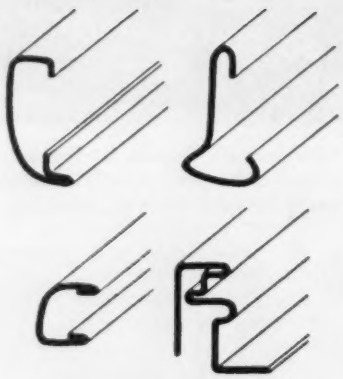
When base metal is encased in rust-preventing zinc by the Hot-Dip Galvanizing process the ravages of rust and corrosion can't touch the metal because it is *sealed in.* Rust and corrosive elements are *sealed out.*

Write for Membership Roster

Every member of this Association has the cumulative experience of the entire membership at his disposal. He has the most modern equipment and a trained organization that are at your service. For membership roster, write The Secretary, American Hot Dip Galvanizers Association, Inc., First National Bank Building, Pittsburgh, Pa.

hot-dip GALVANIZING

ROLLS



DESIGNERS & BUILDERS

of

Metal Forming Rolls for Mouldings & Structural Sections .010" to .062" Aluminum, Brass, Cold Rolled Steel & Stainless Steel

ESTABLISHED 1938

ACME ROLL CO.
2717 E. Larned Street
Detroit 7, Michigan

ments about 35 per cent from recent peaks.

Detroit—Heaviest automotive scrap lists of the postwar period have been bid in and the pattern of prices and shipments was pretty much the same as a month ago, large tonnages being allocated to specified mills at a price somewhat higher than published quotations. A few brokers are said to have picked up material and now do not know where to go with it. The market generally is completely lacking in strength, with prices static.

Chicago—Following purchases by two mills of several major steelmaking grades the week before last, one of these interests last week again came into the market with its June orders for dealer material. The price for No. 2 heavy melting scrap being sustained at $20; that for No. 2 bundles, $18. Later buys of short shovel turnings at $16 and cast iron borings at $15 were $1 higher than several local brokers had previously been willing to close on, and while the tonnage of these grades was reportedly small, in the absence of any other orders temporarily made the market. Activity in other grades was apparently lacking, foundries and several independent mills continuing to cut into inventories.

St. Louis—Scrap prices softened $1 to $3 per ton last week, with quotations strictly nominal. With mill and foundry stockpiles at 60 days or more, there is almost a total lack of demand. Most of the few remaining buying contracts expire in the next week, but brokers are far from certain there will be any renewals. The few sales being made are attributed by purchasing agents to a desire to keep their faithful suppliers "alive," and by the sellers to a determined buyer effort to force price quotations still lower. Shipments from remote points continue to taper, with the result some dealers are being forced to deliver at current prices railroad scrap which they acquired at $60.

Los Angeles—Scrap buying remains limited and highly selective, with prices unchanged. Little material is available locally, in any case, and mills are relying principally on stockpiles and foreign scrap. Both buyers and dealers are having their troubles with off-shore material. In most cases, cost is now well above domestic market, and quality often below specification.

San Francisco — Domestic scrap movements continue restricted and the price tone remains soft. Mills are buying only small amounts of the best material. Slackening operations indicate little chance of a pick-up in scrap demand the remainder of the year, and incoming scrap from Japan and the Orient will be more than sufficient to meet most needs.

Seattle—Steel scrap in sufficient tonnages to supply current needs is arriving at the mills on the recently revised price of $17 for No. 1 and No. 2 heavy melting. In view of uncertain conditions, inventories are not being unduly increased. Dealers report business stagnant, adding they cannot afford to prepare scrap under the reduced price schedule. The ship breaking industry is practically idle. The current supply of hulls has been exhausted and no obsolete ships are being offered for scrap.

WE'LL STICK TO Basic Ideas

In Design, Construction and Materials

It is a fine thing to propose wonderful theoretical ideas about well water systems and vertical turbine pumps, but Layne never ventures away from everyday basic ideas. That fact may account for the world-wide use and popularity of Layne Well Water producing equipment. It certainly accounts for such things as high efficiency, rugged construction and reliability of operation. So until the impossible happens, you can be sure that Layne engineers and designers are sticking to basic ideas that always pay off in satisfaction to the user.

Of course Layne Well Water Systems are as modern as tomorrow, in that they are properly designed and constructed of the finest tested and proved materials. Furthermore they are as accurate in precision building as modern tooling and experienced workmanship can make them.

In buying a well water system, you naturally want a full dollar's worth of value. You want a maximum amount of water at a minimum of daily operation cost—plus freedom from breakdown and repair expense. Those requirements just about sum up exactly what you get when you choose a Layne Well Water System. For further information, catalogs, bulletins, etc., address Layne & Bowler, Inc., Memphis 8, Tenn.

LAYNE
WELL WATER SYSTEMS

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Pacific, Inc., Seattle, Wash. ★ Layne-Texas Co., Houston, Texas ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Minnesota Co., Minneapolis, Minn. ★ International Water Corporation, Pittsburgh, Pa. ★ International Water Supply, Ltd., London, Ont., Can. ★ Layne-Hispano Americana, S. A., Mexico, D. F.

Warehouse . . .

Warehouse Prices, Page 155

Cleveland—Warehouse prices on cold-finished carbon bars and hot-rolled alloy bars were revised downward June 1. Reduction on cold-finished carbon rounds and hexagons was 25 cents per hundred pounds, while the cut on cold-finished flats 6 in. wide and under and on squares over ¼-in. was 75 cents per hundred pounds. Drop in hot-rolled alloy bars ranged from 40 to 50 cents per hundred pounds.

The price reductions follow a substantial decline in demand for cold-finished carbon bars and hot-rolled alloy bars and were made entirely on the initiative of the warehouses, no cut having been made yet in mill prices.

To make the 75-cent reduction in cold-finished carbon flats and squares, the warehouses are absorbing a 50-cent per hundred extra charged by mills. This particular extra did not apply to cold-finished carbon rounds and hexagons.

No overall improvement in demand for steel is noted by warehouses, although some report there are occasional substantial orders, which indicate, perhaps, some consumers have completed their inventory reduction.

New York—Slump in warehouse demand covers all products, notably flat-rolled. Including plates, supply and demand balance has been completely reversed; buying is off on some products nearly 70 per cent.

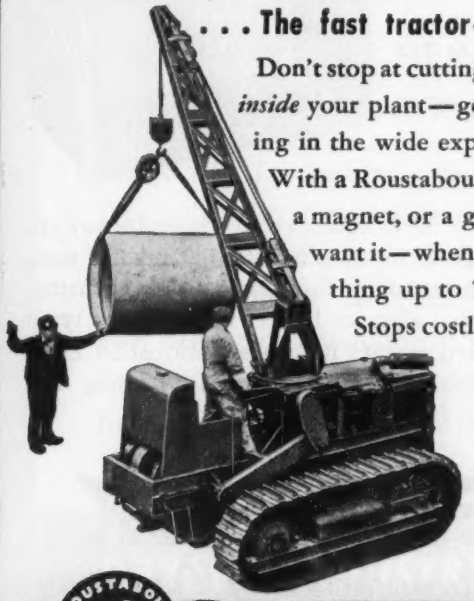
Boston—Some warehouses have not ordered for third quarter and are revising tonnage already placed in line with slower demand. Decline in demand is accompanied by easing prices in some directions. Slump in flat-rolled is sharp. Warehouse stocks are becoming balanced, even galvanized sheets.

Pittsburgh—Steel distributors reduced the price $2 per ton on 10-gage galvanized sheets to $6.90 per 100 pounds, effective May 31, to reflect lower mill galvanized coating extras which were reduced an average of $1.50 per ton as result of latest decline in zinc price. No significant change has been recorded in warehouse steel shipments the past few weeks as customers continue to limit new orders to actual needs based on substantially lower production and maintenance requirements.

Hot-rolled and cold-finished alloy bar warehouse mark-up was reduced 8 points to 50 per cent by Joseph T. Ryerson & Sons Inc. here, effective June 2. The price action represents reduction of $4 per ton on hot-rolled and $10 on cold finished. To cite a few items, the company is now quoting Pittsburgh country price of $9.20 per 100 pounds for hot-rolled annealed 4140 series, $11.70 for same series heat treated; cold-finished 4140 annealed is $10.55 per 100 pounds, $13.05 for heat treated including stress relieving. Similar action by other distributor of alloy bars was expected to be taken by the week end.

Philadelphia—While some jobbers reported a slight improvement in business in May, the overall trend was downward and most distributors look for a further reduction this month. In fact, few anticipate much

Reduce Costs Outdoors as Well as In with
ROUSTABOUT CRANES
. . . The fast tractor-footed load hustlers



Don't stop at cutting materials handling costs *inside* your plant—go outside and start slashing in the wide expanses that eat up profits. With a Roustabout crane you've got a hook, a magnet, or a grab-bucket anywhere you want it—when you want it. Handles anything up to 7½ tons, uphill or down. Stops costly, manpower-wasting delays. Modernly engineered for years of overwork . . . mounted on crawler or wheel tractors. Write for the whole efficiency story now—to Dept. H-4

ROUSTABOUT CRANES
HUGHES-KEENAN CORPORATION
DELAWARE, OHIO, U. S. A.
Load-Handling Specialists since 1904

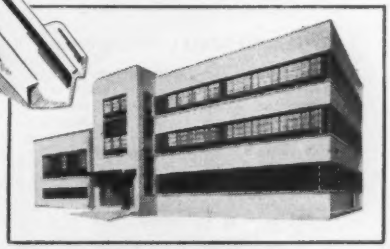
HANSON-VAN WINKLE-MUNNING CO., MATAWAN, NEW JERSEY, U.S.A.

YOUR KEY TO Better SERVICE...

Continuing research, backed by almost a century and a half of experience, enables H-VW-M to consistently open up new and better ways of meeting the requirements of the electroplating and polishing industry . . . to develop new products and new methods that serve the industry better.

H-VW-M may be the key you're looking for to solve puzzling pickling, polishing, buffing, cleaning, anodizing or plating problems, or to provide new ideas to help you serve your customers better.

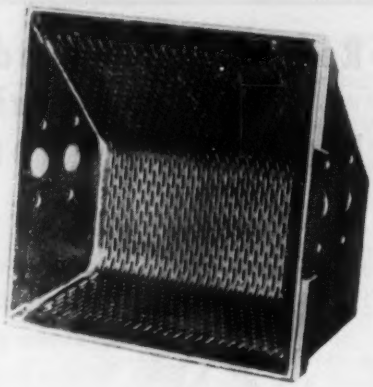
Visit Hanson-Van Winkle-Munning headquarters, Hotel Schroeder at the A.E.S. Convention, Milwaukee, Wisconsin, June 27th through 30th, 1949.



H-VW-M's new laboratory at Matawan, N. J., provides the ultimate in facilities for research and development in the electroplating and polishing field.

HANSON-VAN WINKLE-MUNNING COMPANY
MATAWAN, NEW JERSEY
Manufacturers of
a complete line of electroplating and polishing equipment and supplies
Plants: Matawan, New Jersey • Anderson, Indiana
Sales Offices: Anderson • Chicago • Cleveland • Dayton • Detroit
Grand Rapids • Matawan • Milwaukee • New Haven • New York • Philadelphia
Pittsburgh • Rochester • Springfield (Mass.) • Stratford (Conn.) • Utica
SINCE 1920
5307

Typical of Hendrick's **Manufacturing Facilities**



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.

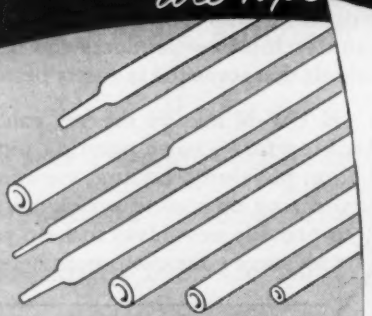
SEE OUR CATALOG IN SWEET'S

HENDRICK
Manufacturing Company
30 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

McDANEL
HIGH TEMPERATURE PORCELAIN COMBUSTION TUBES *are Tops*

For Carbon and Sulphur DETERMINATIONS



Every stage of production in the manufacture of McDanel Porcelain Combustion Tubes and Zirco Tubes is carefully controlled to assure outstanding performance in your carbon and sulphur determinations.
Density, bore size, wall thickness, gas tightness, resistance to thermal shock — are all checked before shipment. When you receive your order of McDanel Combustion or Zirco Tubes from your supplier you may have complete confidence in their ability to give unexcelled service.

OTHER McDANEL PRODUCTS

- Non-Spalling, non-blistering, gas tight Combustion Tubes.
- High Temperature Zirco Tubes.
- Self Cooling Combustion Tubes.
- Refractory Porcelain Specialties in stock or made to your specifications for your individual needs.

Specify McDanel High Temperature Porcelain Combustion Tubes and Zirco Tubes from your supplier.

McDANEL
REFRACTORY PORCELAIN CO.
BEAVER FALLS, PA.

improvement before late summer or early fall.

Cincinnati—Jobbers, basing judgment on early June ordering, expect sales this month to equal those of May which were considered satisfactory although showing a major drop from the corresponding month last year. Inventories are rounding into normal condition. Quotations on cold-rolled bars have been cut 24 cents per 100 lb. here.

Detroit — Jobbers have revised prices on some products. Effective May 31, prices on cold-finished bars and hexagons were lowered $5 per ton, making the price here on cold finished 5.90c per pound. Merchandising extra, formerly charged on flats under 6 in. and on squares, has been eliminated, amounting to a $15 per ton cut. Galvanized sheet prices have been cut in line with the lower zinc price, the Detroit figure on 10-gage being 7.43c, representing a $2 per ton drop.

Chicago — Through absorption of the 5-cent switching charge and reduction of 25 cents per 100 pounds on cold-finished bars, major district warehouses last week brought base prices of this product to $5.40, the city delivered price being $5.60. The cut, for warehouse-based steel, thus amounts to $6 a ton on rounds and hexagons. Cold-finished flats and squares, in addition to this base price reduction, were relieved of a $10 a ton size extra charge. The normally slow movement of the latter items, warehousemen say, had justified inclusion of this extra, but lagging demand in recent weeks has made its abolition advisable. Previous to the cold-finished bar reductions, warehouses generally cut their markups on alloy products 8 percentage points, which amounts to $8 a ton on 4140 hot-rolled alloy bars in the as-rolled condition. New price is $7.70, f.o.b. warehouse, and $7.85, city delivered.

Birmingham—Warehouse interests describe the general situation as "comparatively spotty" even though demand is holding up "fairly well." Plates and small angles, especially, are in tight supply while the situation in sheets, contrary to mill reports, is comparatively easy.

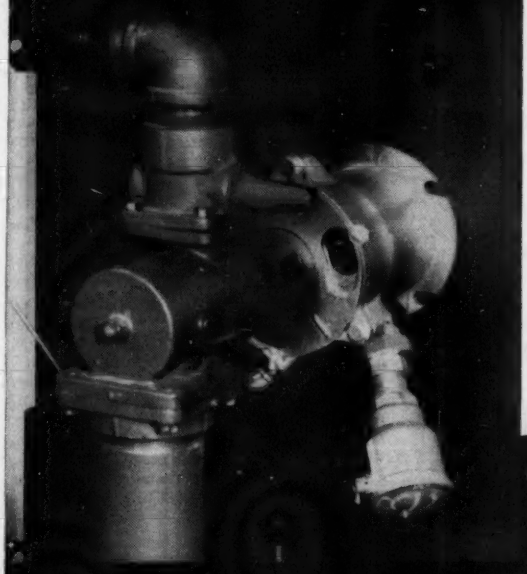
Los Angeles—Although new orders placed with warehouses remain fairly constant in number, the size of orders is shrinking. This reflects the stringent control steel users have placed on inventories, and the growing disposition to buy for immediate requirements only. Buying by equipment fabricators has improved slightly, however. Most warehouses have adjusted universal mill plates downward to the same price as shear plates by removing the 15 cents per 100 lb premium.

San Francisco — Turnover of jobbers' stocks still is running 35 per cent to 40 per cent below this time last year. Supplies of nearly all items are ample and warehousemen are buying as cautiously as their customers.

Seattle — Jobbing houses report ample supplies of all items except sheets, plates and pipe. With allocations removed it is expected that stocks will be complete by the third quarter. Volume of business is reasonably normal. Prices are steady, only minor adjustments having been recently effected.

Bryant Industrial

MIXJECTOR BLAST
TORCH BURNERS



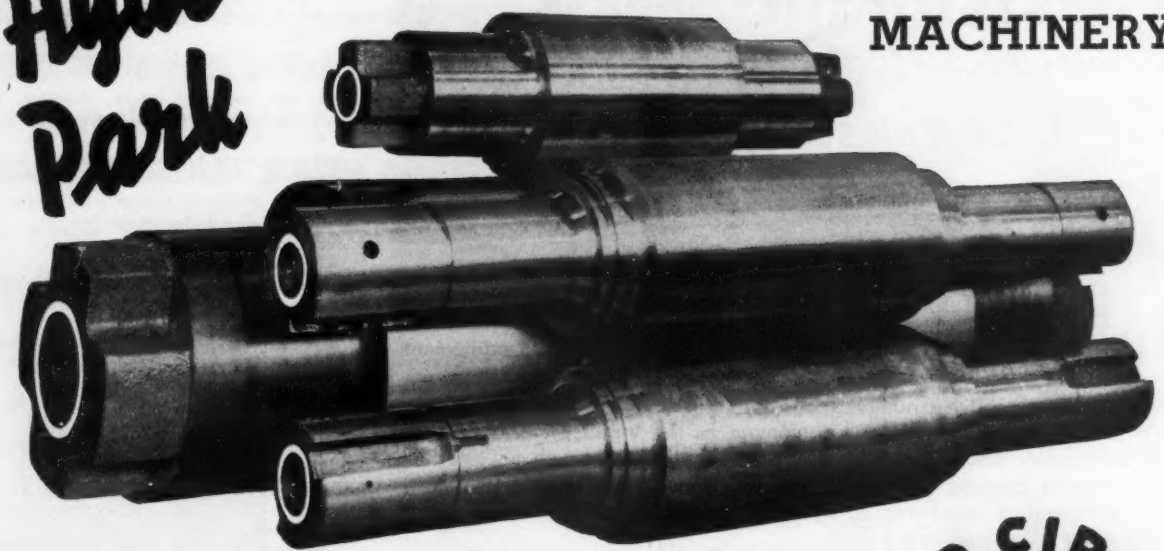
COMPLETE GAS FIRING ASSEMBLIES FOR FURNACES, BOILERS AND KILNS

Mixjector Torches provide two big features: Specially - developed nozzle designed to hold flame tightly at all pressures, plus the Bryant Mixjector, most compact proportional mixer ever designed. Available in 9 sizes, capacities to 6,750,000 Btu per hour with 16-ounce air. *Write for Data Sheet 2C-1 for complete description.*

BRYANT INDUSTRIAL DIVISION
Affiliated Gas Equipment, Inc.
1020 LONDON ROAD • CLEVELAND 10, OHIO

Hyde Park

CHILLED ROLLS and ROLLING MILL MACHINERY



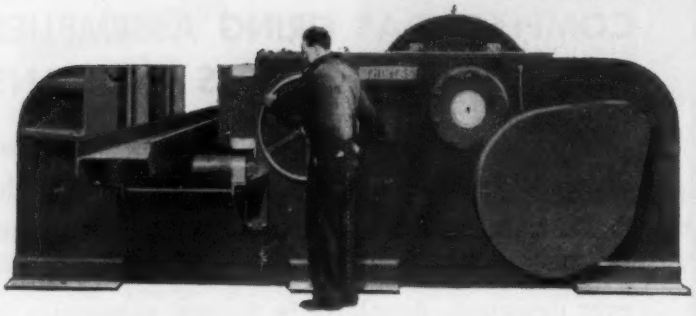
This may be the Atomic Age, but in practice it is still the Steel Age—and one of the constant demands of this age is rolled steel products. To those who juggle rolled steel against prices and markets, superior equipment is frequently the difference between profit and loss. The Hyde Park Foundry and Machine Co. is equipped to design and manufacture individual chilled rolls or complete rolling mill units. Their accumulated knowledge of rolls, rolling mill machinery and procedure is available to all who inquire. Free consultation is part of our practice; you should take advantage of it.

RED CIRCLE Rolls CHILLED

HYDE PARK FOUNDRY & MACHINE CO.
HYDE PARK *(Pittsburgh District)* PENNSYLVANIA

THOMAS

BENDING AND STRAIGHTENING Machines



THESE MODERN MACHINES are of all-steel construction and come in various sizes, in capacities from 50 to and including 400 tons. Convenient adjustments for easy, accurate operation.

Write for Bulletin 315

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23, PA.

9

You can *bear down...* ON WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINE *Bearings!*

Wherever light weight, compact, yet dependable take-off power drives are specified for Wisconsin Heavy-Duty Air-Cooled engine powered equipment . . . V-Belt and Chain drives are popular!

Drive pulley is attached directly to the extended Wisconsin crankshaft on such famous equipment as the V-Belt driven Ingersoll-Rand Compressor above. Outboard bearing is eliminated with no sacrifice in efficiency or increase in engine wear. *Both radial and end thrust loads, or any combination, are taken up by tapered roller bearings built into each end of every Wisconsin crankshaft!*

Couple this adaptability with air-cooling to 140° F., yet fast starts and steady power in sub-zero weather, plus oil pump lubrication that minimizes maintenance . . . and you buy the finest power in the 2 to 30 hp., air-cooled field.

Write for information . . . 4-cycle, singles, two-, and four-cylinder models.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1400 tons, office building, Massachusetts Mutual Life Insurance Co., Springfield, Mass., to Bethlehem Steel Co.; Turner Construction Co., Boston, general contractor.

1366 tons, grade separation, St. Joseph, Mich., to American Bridge Co., Pittsburgh.

900 tons, factory, V. Larosa & Sons, Hatboro, Pa., to Bethlehem Steel Co.

600 tons, Sacred Heart school, St. Albans, N. Y., to Grand Iron Works Inc., New York.

400 tons, addition, public school No. 81, New York, to unnamed fabricator.

170 tons, bakery, National Biscuit Co., Rochester, N. Y., to Bethlehem Steel Co.

150 tons, industrial building, Skokie, Ill., through Brown & Matthews Inc., New York, engineer, to Bethlehem Steel Co.; also 150 tons of joists.

100 tons, lintels, Parkside Houses, New York, to Chiaet Ornamental Iron Works, that city.

100 tons, state bridge, Sussex county, New Jersey, to Bethlehem Steel Co.

STRUCTURAL STEEL PENDING

2000 to 3000 tons (also 300 tons grillages and anchors), transmission towers; bids to Bonneville Power Administration, Portland, Oreg., June 16.

1500 tons, bridge superstructure, Anisquan river, Glocester, Mass.; bids June 21, Massachusetts Department of Public Works, Boston.

1475 tons, three sections, state turnpike, Chester county, Pennsylvania; bids July 6.

1000 tons or more, public school No. 240, New York; bids close soon.

1250 tons, engine repair building, naval air station, Quonset Point, R. I.; bids postponed to June 10.

950 tons, warehouse, First National Stores Corp., East Providence, R. I.

800 tons, state turnpike, Daulphin county, Pennsylvania; J. H. Wickersham, Lancaster, Pa., low on general contract.

580 tons, state turnpike, Lancaster county, Pennsylvania; bids July 11.

500 tons, state highway bridge, Willamette river; bids June 28 to H. B. Glaisyer, secretary, State Highway Commission, Salem, Oreg.

460 tons, Wyckoff Heights Hospital, Brooklyn, N. Y.; bids asked.

425 tons, parochial school, Brooklyn, N. Y.; Samuel Juster, 366 Broadway, New York, architect.

300 tons, state bridge, Palisades avenue, Jersey City, N. J.; bids June 16, Trenton.

300 tons, Palisades avenue state bridge, Jersey City, N. J., bids June 16.

300 tons, admission building, state hospital, Harrisburg, Pa.; bids June 22.

200 tons, span over Okanogan river, Washington; bids to U. S. Engineer, Seattle, June 24.

180 tons, service station, Delaware Light & Power Co., Wilmington, Del.; bids closed June 3.

150 tons, addition, Hotel Astor, New York; bids asked.

Unstated, Shaw Avenue School, Hempstead, Long Island; bids asked.

Unstated, railroad-highway project, Turnagain Arm, Alaska; general contract to Morrison-Knudsen, Peter Kiewit Sons Co. and S. Birch & Sons, low joint bid $5,436,036.

REINFORCING BARS . . .

REINFORCING BARS PLACED

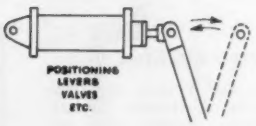
155 tons, Washington state bridge near Waterville, to Bethlehem Pacific Coast Steel Corp., Seattle.

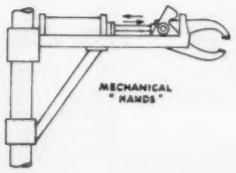
REINFORCING BARS PENDING

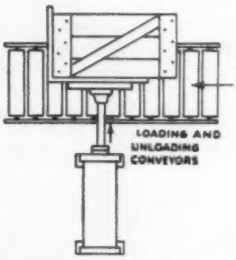
570 tons, Louisville flood protection works, section A, part 1; bids June 24, Corps of Engineers, Louisville, Ky.

240 tons, flood protection, Mound City, Ill.

Here's how to
• CUT COSTS!
• SAVE TIME!
• IMPROVE PLANT OPERATION!







Send for a copy of this Bulletin

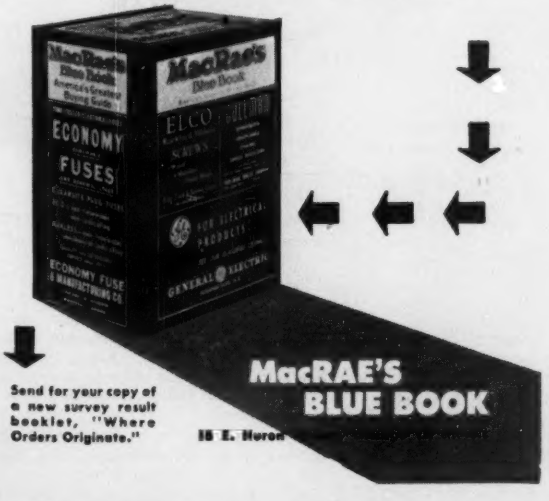
HANNIFIN CORPORATION
1101 South Kilbourn Ave.
Chicago 24, Illinois

Let HANNIFIN Pneumatic Cylinders do the work!

"AUTOMATION" is an interest-rousing new term that describes some of the many ways in which pneumatic cylinders are being used to actuate and power automatic work-saving devices. Hannifin is playing an important part in this development by supplying cylinders that are *right for the job* and engineering *know-how* second to none when it comes to applying cylinders to the job.

If you are interested in using cylinders to SAVE TIME . . . REDUCE PHYSICAL EFFORT . . . CUT COSTS . . . and IMPROVE PLANT OPERATION, get in touch with HANNIFIN today. Engineering recommendations on request. Experienced Factory-trained field representatives in all leading industrial centers.

At 9 out of 10 of the largest and most important decision points in American industrial purchasing, MacRAE'S BLUE BOOK is used as a reference source "principally" or "exclusively."



Send for your copy of a new survey result booklet, "Where Orders Originate."

18 E. Huron

. . . Uniform, Dependable

ROUND · FLAT · HALF ROUND · STRAIGHTENED and CUT

High Carbon Spring · Oil tempered M.B. and H.B. · Aircraft · Signal Corps & Rope Wire, Enamelled or Galvanized. Low Carbon Basic and Bessemer. Commercial Bronze and Aluminum.

Wire for practically all purposes and requirements . . . Also Screen Wire Cloth. Highest Quality and Service Guaranteed.

ESTABLISHED 1905

Seneca WIRE MFG. COMPANY
FOSTORIA, OHIO
REPRESENTATIVES AND WAREHOUSES IN PRACTICALLY ALL PRINCIPAL CITIES

Cache river diversion; bids June 23, Corps of Engineers, Louisville, Ky.

200 tons, Washington state highway projects; bids in.

175 tons, state highway bridge, Willamette river; bids June 28 to H. B. Glaisyer, secretary State Highway Commission; Salem, Oreg.

110 tons, Palisades avenue state bridge, Jersey City, N. J., bids June 16.

110 tons, state bridge, Palisades avenue, Jersey City, N. J.; bids June, Trenton.

75 tons, span over Okanogan river, Washington; bids to U. S. Engineers, Seattle, June 24.

PLATES . . .

PLATES PLACED

Unstated, ½ million-gallon water tank for Tumwater, Wash.; general contract to Ziegler Welding Works, Olympia, $21,154.

PLATES PENDING

400 tons, two 1 million-gallon steel standpipes, Atomic Energy Commission, Los Alamos, N. Mex.; bids June 16.

Unstated, 2 million-gal. welded steel water tank for Coulee Dam, Washington; bids to Bureau of Reclamation, Denver, June 28.

PIPE . . .

CAST IRON PIPE PENDING

Unstated, 2700 feet 6 and 4 inch cast iron pipe and fittings; bids to Gordon Turcott, secretary, King county district No. 49, Seattle, June 3.

STEEL PIPE PENDING

Unstated, replacement of 17 miles wooden water pipe with steel at Fort George Wright and Spokane, Wash., air base; $1.5 million project; project approved by U. S. Engineer; funds not yet available.

RAILS, CARS . . .

RAILROAD CARS PLACED

Southern Railway, 200 70-ton covered hopper cars, to Birmingham, Ala., plant of Pullman-Standard Car Mfg. Co.

RAILS PLACED

Florida East Coast, 7000 tons, with 6000 tons going to the Carnegie-Illinois Steel Corp. and 1000 tons to the Bethlehem Steel Co.

CONSTRUCTION AND ENTERPRISE

IOWA

MARSHALLTOWN, IOWA—Minneapolis & St. Louis Railway Co., C. S. Weatherill, chief engineer, Northwestern Bank Bldg., Minneapolis, has awarded a $400,000 contract to James Leck Co., 211 S. 11th St., Minneapolis, for construction of a diesel locomotive repair shop.

KENTUCKY

LOUISVILLE—Great Atlantic & Pacific Tea Co., 420 Lexington Ave., New York, will build a $1.7 million warehouse, office and plant.

LOUISIANA

LAKE CHARLES, LA.—Citizens Publishing Co., c/o Dunn & Quinn, architect, will build a $500,000 printing plant.

NEW ORLEANS—International Harvester Co., A. J. McCaffrey, president, has plans underway for a twine and fiber mill.

NEW ORLEANS—Stephens Buick Co., c/o Frevet & Wolf, architect, 630 Gravier St., will build a $700,000 auto sales and service building.

MARYLAND

BALTIMORE—Maryland Lumber Co., 1100 E. Fayette St., will build a mill, Center St. and Fallsway; plans by Harry D. Katz, 3212 Gwynns Falls Parkway.

MICHIGAN

MOUNT CLEMENS, MICH.—General Motors Corp., General Motors Bldg., Detroit, has awarded a contract to Bryant & Detwiler Co., 2304 Penobscot Bldg., Detroit, for construction of a technical center; Saarinen, Saarinen & Associates, Bloomfield Hills, architect; Smith, Hinchman & Grylls Inc., 800 Marquette Bldg., Detroit, architect and engineer.

MINNESOTA

ST. PAUL—Cities Service Oil Co., B. W. Horne, superintendent, 500 Robert St., will build a $250,000 warehouse, Thomas and Fairview Aves.

NEBRASKA

OMAHA, NEBR.—Baker Mfg. Co., Evansville, Wis., will build a $100,000 branch warehouse.

NEW JERSEY

LINDEN, N. J.—International Harvester Co., 122 E. 42nd St., New York, has awarded a $464,000 contract to Joseph L. Muscarelle Inc., 42 First St., Hackensack, N. J., for construction of a distributing plant, W. Linden Ave. at Stiles St.

NEW YORK

BROOKLYN, N. Y.—Hearst Corp., New York Mirror Division, 235 E. 45th St., New York, will build a $300,000 plant, 540 Atlantic Ave.; plans by Lockwood Greene Engineers Inc., 10 Rockefeller Plaza, New York.

LONG ISLAND CITY, N. Y.—Twenty-four Street Plaza Realty Corp., c/o David Levy, architect, 70 E. 45th St., New York, will build a $270,000 factory, Bridge Plaza south near 24th St.

NEW YORK—Pioneer Ice Cream Division, Borden Co., 205 E. 24th St., will build a $238,000 ice cream storage plant; plans by G. Norman Robinson, 25 W. 43rd St., New York.

NEW YORK—Roux Distributing Co., 1841 Park Ave., will build a $950,000 factory and office, 153rd St. and River Ave.; plans by Walter M. Cory, 29-28 41st Ave., Long Island City, N. Y.

SYRACUSE, N. Y.—General Electric Co., Seventh North and Hopkins Rd., will build a $1 million television tube plant, Electronic Park.

OHIO

CLEVELAND — General Motors Corp. will build a $215,000 warehouse and office at 3101 W. 110th St.

CLEVELAND — Yoder Co., 5500 Walworth Ave., will expand its present space in its five buildings, W. 55th & Walworth Ave.; construction date in future.

CLEVELAND—Vogue Investment Co., headed by Harry L. Wolpaw, Society for Savings Bldg., will build a $1,850,000 apartment group, S. Moreland Blvd., Shaker Heights, O.

CLEVELAND — The new $215,000 warehouse and office building which is being started by General Motors Corp. at 3103 W. 110th St., will be occupied by the United Motors Service Division as a parts warehouse.

CLEVELAND—United Machine & Tool Co., 8205 Clinton Ave., has been incorporated under a new name, Wire & Son Machine Products Inc., William W. Wires Jr., president. William W. Wires Stamping Co., which is a proprietorship owned by William W. Wires Sr., will remain at the 8205 Clinton Ave. plant.

LANCASTER, O.—Diamond Power Specialty Corp., Willis P. Thomas, president, 10340 Oakland St., Detroit, will build a $1.5 million to $2 million plant for manufacture of industrial television sets and power plant boiler accessories on 37-acre tract on U. S. 22. 2 miles east of Lancaster.

OKLAHOMA

CUSHING, OKLA.—Deep Rock Oil Corp. plans a cracking plant; Jones & Laughlin Supply Co., contractor; Universal Oil Products, designer.

MIAMI, OKLA.—B. F. Goodrich Co. will build a $400,000 warehouse.

PENNSYLVANIA

ELLWOOD CITY, PA.—Ellwood City Chamber of Commerce will erect a $150,000 knitting mill and office building for a manufacturer of knit goods, to be built on Lawrence Ave.; D. J. Schill, 600 Lawrence Ave., is secretary of the Chamber of Commerce.

PHILADELPHIA—E. I. du Pont de Nemours & Co. Inc., Du Pont Bldg., Wilmington, Del., will build a $2 million research laboratory, Grays Ferry Rd.

WEST POINT, PA.—Sharp Dohme, 640 N. Broad St., Philadelphia, will build a $250,000 research laboratory; John M. Waligora, c/o owner, chief engineer.

TENNESSEE

MEMPHIS, TENN.—Massey-Harris Co., John Parsons, engineering department, Racine, Wis., plans erection of a branch factory on Louisiana, near Olive, part of a $2 million expenditure; Hanker & Heyer, Commerce Title Bldg., Memphis, architect.

TEXAS

CORPUS CHRISTI, TEX.—Louis E. Meekins, 1101 N. East 23rd St., Fort Wayne, Ind., will build a $1,750,000 grain elevator; Faleide Engineering Co., 53 W. Jackson St., Chicago, consulting engineer.

DALLAS—Lone Star Gas Co., 1915 Wood St., received bids May 31 for an office building, Wood & Park Aves.

DECATUR, TEX.—Cities Service Oil Co., Bartlesville, Okla., will build a $750,000 casinghead gasoline plant unit, own forces.

EL PASO, TEX.—El Paso Natural Gas Co., Paul Kayser, president, plans to build a $2.5 million office building.

HOUSTON—Phillips Chemical Co., c/o City National Bank Bldg., will build a $500,000 fertilizer plant expansion.

HOUSTON—National Steel Products Co., subsidiary of National Steel Corp., Pittsburgh, will let contract to Hubbard Construction Co., 1507 Delano St., for construction of a $1.5 million warehouse, Lockwood Drive industrial area.

JOURDANTON, TEX.—Humble Oil & Refining Co., Humble Bldg., Houston, has awarded a $450,000 contract to Hudson Engineering Corp., 2711 Danville St., Houston, for construction of generating units.

ORANGE, TEX. — Consolidated Steel Corp. plans purchase of wartime naval shipyard; plans expanded steel products work; plans to install additional equipment.

PALESTINE, TEX.—Glidden Co., Berea and Madison Sts., Cleveland, will build a $1.5 million food plant.

UTAH

SALT LAKE CITY, UTAH—Chicago Bridge & Iron Co. plans to construct a $125,000 building to house its offices here. The company is now operating its $175,000 No. 1 shop in Salt Lake City, and its second expansion project, costing $325,000, is nearing completion. It consists of a No. 2 shop and large crane runway.

WASHINGTON

TENINO, WASH.—Pacific Powder Co. will spend $150,000 in construction of three buildings at the powder plant.

CANADA

LEDUC, ALTA.—Imperial Oil Ltd., 50 Church St., Toronto, Ont., has awarded a $6.5 million contract to C. F. Braun Co. Inc., Alhambra, Calif., for construction of a compressor station and gasoline absorption plant, Leduc oilfields.

PORT EDWARD, ONT.—Canadian National Railways, B. Wheelwright, chief engineer, 360 McGill St., Montreal, Que., and Canada Steamship Lines, Montreal, will build $1 million freight sheds.